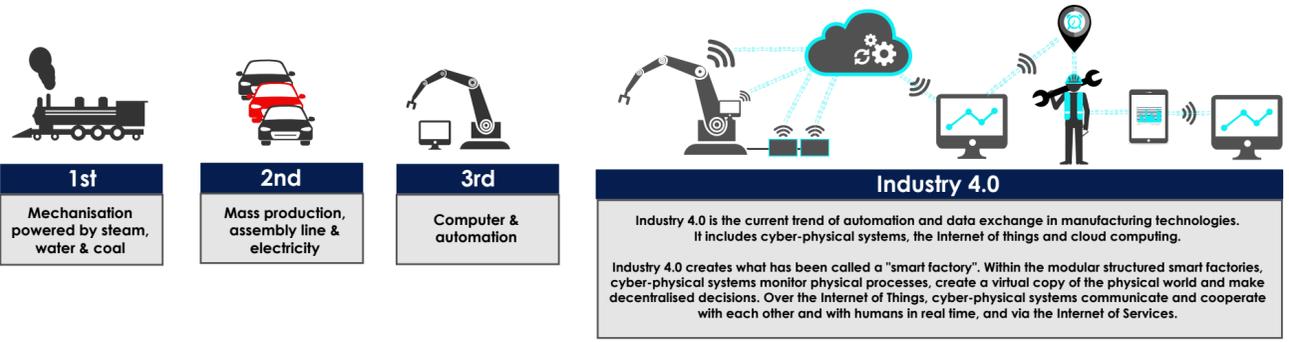# INDUSTRY 4.0
The Fourth Industrial Revolution

Industry 4.0 has been dubbed the fourth industrial revolution and is all about how manufacturers will take the next technological leap to create more connected, more efficient factories and production environments, using cyber-physical systems such as the Industrial Internet of Things (IIoT).

In this infographic we will look at the 5 main technologies that are driving the next industrial revolution.

Industrial Revolutions Timeline

1st — Mechanisation powered by steam, water & coal

2nd — Mass production, assembly line & electricity

3rd — Computer & automation

Industry 4.0

Industry 4.0 is the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things and cloud computing.

Industry 4.0 creates what has been called a "smart factory". Within the modular structured smart factories, cyber-physical systems monitor physical processes, create a virtual copy of the physical world and make decentralised decisions. Over the Internet of Things, cyber-physical systems communicate and cooperate with each other and with humans in real time, and via the Internet of Services.

Internet of Things (IoT)

What is it?

The Internet of Things is the latest trend of creating connected networks of smart sensors to monitor and gather large amounts of usage data from machines and devices in order to predict and prevent catastrophic failures before they occur. This data is then fed into CRM and ERP systems to give accurate insights into how machines and devices are functioning in order to improve performance.

Example:

Data measured could come from machine fluid levels, temperatures, number of actions carried out or movement speed of working parts. This data combined with powerful machine learning technologies such as Azure Predictive Maintenance can alert manufacturers or remote service operators to when a machine will require maintenance.

FLUID TEMPERATURE

The global IoT market is expected to reach $19 trillion by 2020, with 26 billion embedded devices. [†1]

Cloud Computing / Big Data Analytics

110100111011

What is it?

Cloud data storage accomodates masses of volume of IoT data from all connected devices and smart sensors. This information can then be systematically analysed and disected using Azure Machine Learning capabilities and output via Dynamics 365 and Power BI to provide insights into business metrics.

Example:

Having a cache of accurate data can help manufacturers to predict when to order new components and arrange maintenance staff reources to carry out out work for when it is expected they will be required. These large amounts of data sets can be fed through machine learning algorithms to provide valuable reports which can preemptively predict machine failures.

01101   100101

Advanced Robotics

What is it?

Robotics work alongside people to perform complex tasks and free up workers to concentrate on operational and strategic decision making.

New, smart robotics are capable of advanced problem solving and completing intricate procedures whilst communicating with the overall manufacturing eco system.

Example:

Ford Motor Company just recently unveiled a new technology called F3T—Ford Freeform Fabrication Technology. Whereas before, prototyping parts was time consuming and often very expensive, Ford's new technology allows prototypes to be produced and tested in a matter of hours. It's proprietary Ford technology at this point, but we wouldn't be surprised if similar technology started popping up across the industry.

A record 14,583 robots valued at $817m, were ordered from North American Robotics companies in the first half of 2016.

GROWTH SECTORS INCLUDE:

SEMI-CONDUCTORS -	30%
AUTOMOTIVE COMPONENTS -	23%
LIFE SCIENCES -	8%

[†2]

Artificial Intelligence / Machine Learning

What is it?

Machines respond to incoming data patterns, adjusting direction or output to the situation at hand. When fully implemented, the technology will drive enormous cost and energy savings.

Microsoft Azure Machine Learning (MAML) is a service on Windows Azure which a developer can use to build a predictive analytics model using machine learning over data and then deploy that model as a cloud service.

Example:

Machine Learning is what enables Microsoft to monitor Office 365 and Azure to spot hackers trying to break into accounts, how Cortana can recognise what you're saying, how Kinect can detect the position of your fingers or the joints of your skeleton from an infrared image.

It's also why the keyboard on Windows Phone is so accurate: Data derived from thousands of people correcting mistakes on their phones enables the software to guess which letter you're going to type next and make that key (invisibly) bigger.

3D Printing

What is it?

3D printing or addative manufacturing is where printing technology couples 3D design software with new manufacturing techniques to quickly and cheaply produce parts, prototypes and intricate products using printed layers of high-grade plastics, metals and even composite building materials such as concrete.

Example:

PolyJet 3D works alongside some of the worlds leading architects providing printing technology which produces astonishingly smooth, detailed architectural models in an array of materials, including rigid photopolymers ready for painting. For models that must bear take abuse, FDM Technology builds strong parts in production-grade thermoplastics.

PROTOTYPE PRODUCTION SPEED

The global 3D printing market is expected to reach $20.2 billion by 2019 [†3]