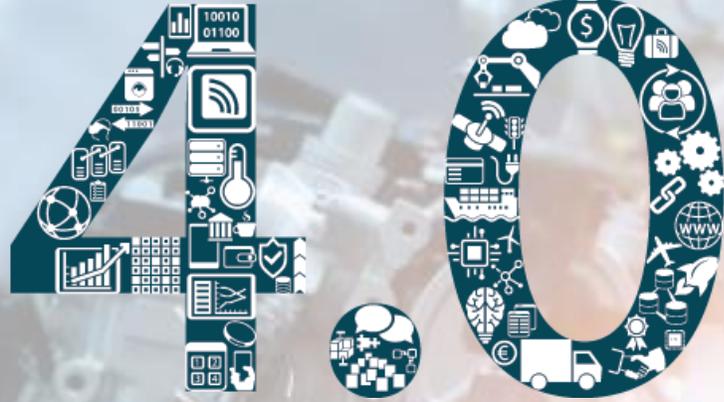


**iken**

**INDUSTRY**



**Revolution**



# WHAT IS INDUSTRY 4.0?

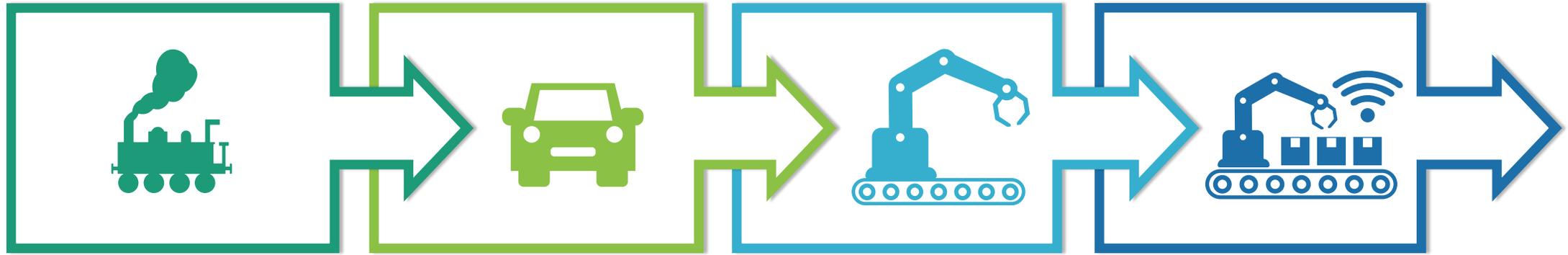
**Industry 4.0 isn't just about investing in new technology and tools to improve manufacturing efficiency—it's about revolutionizing the way your entire business operates and grows.**

Industry 4.0 is a term first coined in Germany in 2011 to describe the computerization of manufacturing regarded as the fourth industrial revolution, it is believed to be the fourth major technological advancement in industrial processing and manufacturing.

Industry 4.0, also known as the Industrial Internet of Things (IIoT) or Integrated Industry, is a revolutionary process connecting every level of an operation, from the machinery on the shop floor to the building management system that controls the entire production environment.



## I4.0 Stages



# 1st

**Industry 1.0**

1784

Mechanical production stream and water power weaving loom

# 2st

**Industry 2.0**

1870

First assembly line mass production electricity discovery of oil and production of petrol

# 3st

**Industry 3.0**

1969

Computer and IT micro circuits and processors automated production global supply chains

# 4st

**Industry 4.0**

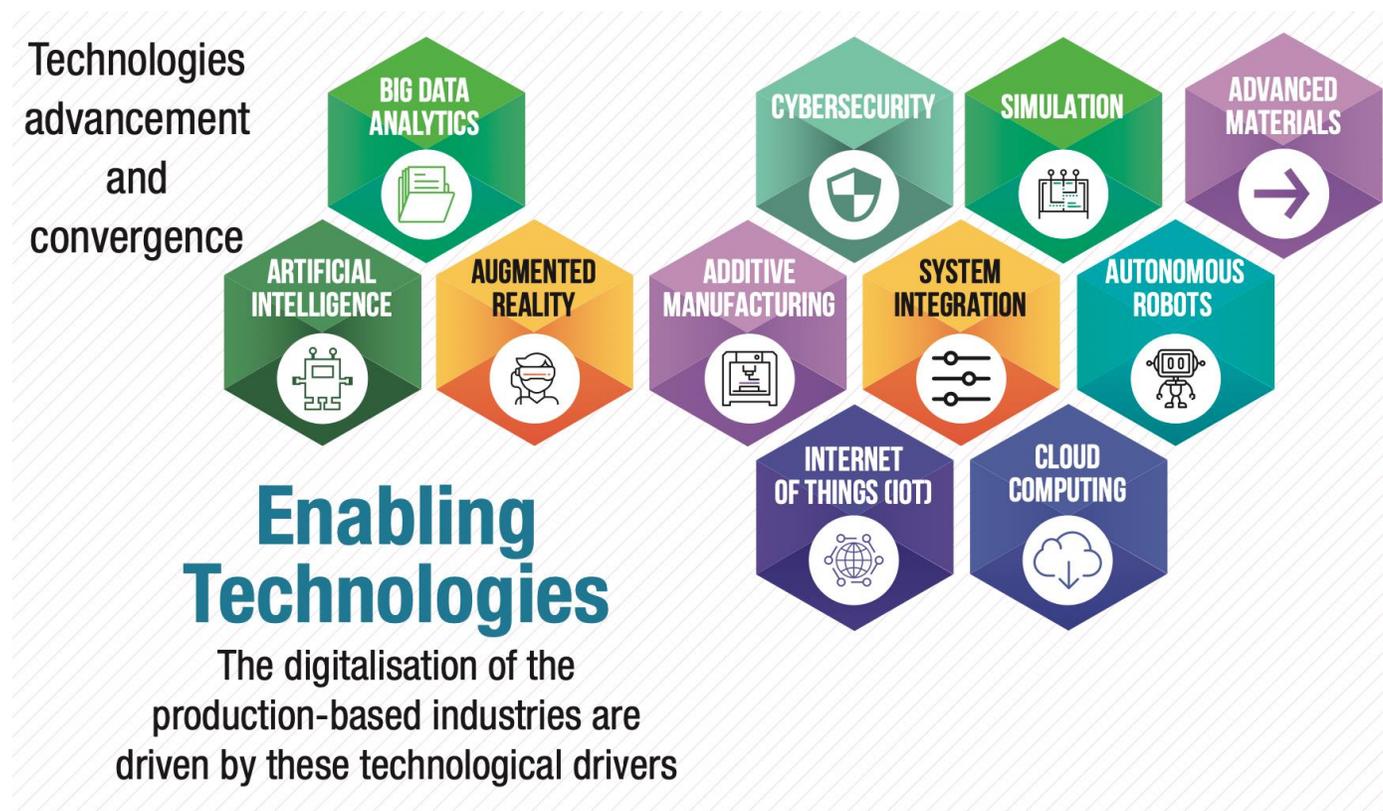
Today

Interconnection of technology mass connectivity smart devices computers in even the smallest devices Real-time data

## The Nine Pillars of Industry 4.0 - Transforming

There are **nine main pillars** of Industry 4.0. These pillars outline the new technology manufacturers are using to improve all areas of production processes.

Whether you work in the manufacturing industry or not, it is imperative to familiarize yourself with these pillars, as they are expected to have a widespread impact across all industries and society as a whole.



# The Nine Pillars of Industry 4.0 - Transforming

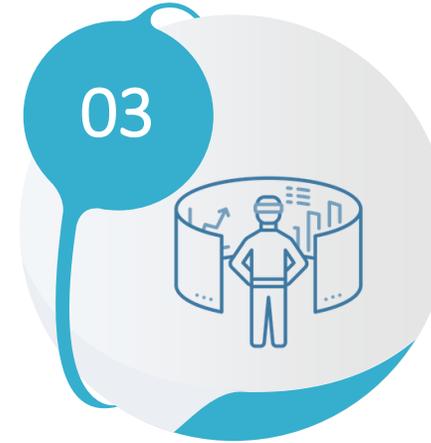
## Augmented Reality

Weather initial augmented reality technologies are still in nascent stages, they are advancing at rapid pace. Some of the first applications can be found in the delivery of information and training, e.g. augmented reality can be used to deliver part replacement instructions to maintenance staff in the field



### IoT

Industry 4.0 technologies embody an unprecedented proliferation of sensors and connectedness among these sensors. Combined with other technologies such as AI and big data, it is now possible to envisage entirely autonomous system that revolutionize the manufacturing



### Simulation

Simulations leverage real-time data to reflect the physical world of product development and production processes in a virtual environment. These models can be used to run more efficient tests so settings and processes are optimized before production even starts, reducing downtime and improving quality.

## Additive Manufacturing

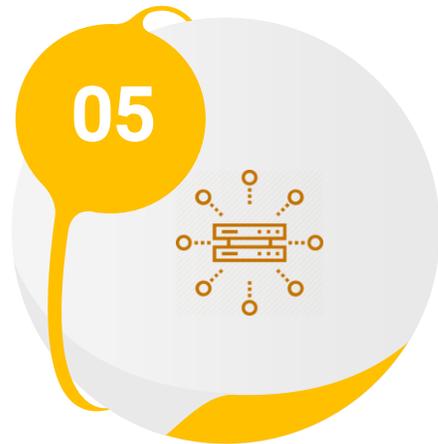
Additive manufacturing is advancing with the use of new materials, opening completely new possibilities. For example 3D printing of organic tissues has created opportunities for growing live organs. It is revolutionizing traditional production, aided by a recent surge in metal additive printing



# The Nine Pillars of Industry 4.0 - Transforming

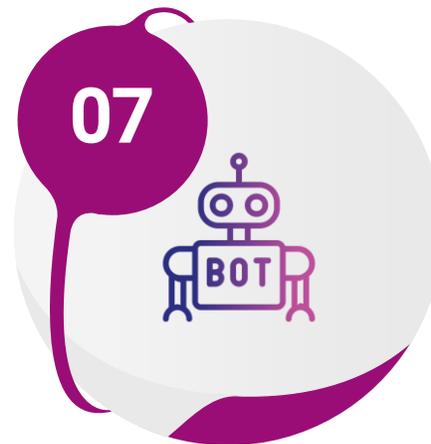
## Cloud Computing

As the use of technology and data sharing at manufacturing companies grows, cloud computing provides scalable storage and increased computing power. The cloud also improves data accessibility and integrity, helping to eliminate data silos.



## System Integration

System integration occurred in the vertical ( within the industry value chain ) and in horizontal systems ( across multiple value chains), eventually achieving end-to-end digital integration across the entire value chain



## Autonomous Systems

While the manufacturing industry has made great strides when it comes to automation over the last few years, there is still a lot of untapped opportunity. Collaborative robots are designed to fill the gaps between traditional robots and human workers and open up new areas for automation. These robots are designed to work in ways similar to humans, with the added ability to monitor and transmit data..

## Cybersecurity

As connectivity increases, the risk of a potential cyberattack grows alongside it. Any security breach could damage multiple areas of the business, from supply chain to operations. It's absolutely critical that companies prepare and protect their information systems and production lines from cyber threats.



## Big Data Analytics

Big data techniques are being applied in manufacturing industry to improve customer experience and product quality, realize energy efficiency and conduct predictive maintenance. It is now possible to collect masses of data from several different sources to direct decisions that anticipate product or equipment failure

# How i4.0 is Transforming Industries?

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The world around us is getting smarter and more connected as the Internet of Things (IoT) has become the cornerstone for most of the organizations.

**IIoT** refers to the extension and use of IoT in industrial sectors and applications.

Many people get confused with the IIoT and IoT as both of them make the use of sensors to enhance the operational process.

Although it seems to be the same, they are different in general usage.

Before understanding their core difference, let's first quickly go through the basics of Industrial IoT.

**The top industries leveraging IoT Solutions include:-**

- Healthcare
- Manufacturing
- Energy
- Smart Cities
- Transportation
- Agriculture



# How i4.0 is Transforming Industries?



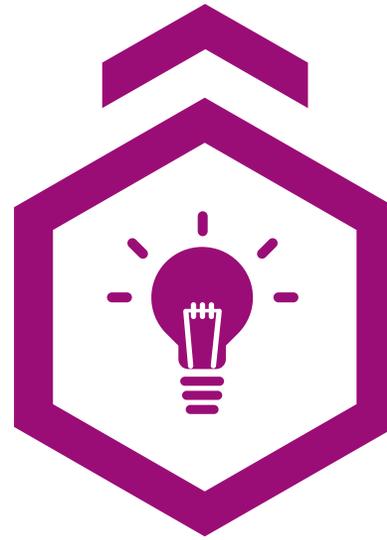
## Healthcare

Digital services, AI  
in entertainment  
and activities,  
Guests  
management  
system



## Agriculture

Precision  
Agriculture and  
supply chain.



## Energy

Green resources,  
Waste recycling  
management.



## Transportation

Smart Parking,  
Transport Logistics,  
Fleet Management



## Manufacturing

Dashboard,  
Efficient  
automation, Quality  
raise, Supply Chain  
optimization,  
Additive  
technology.

# How i4.0 is Transforming Industries?



## Healthcare

i4.0 Application in the healthcare industry means not only more efficient business, but can mean better service for the patient.

For instance, the hospital staff gets alerts for repairing and maintenance of medical equipment such as MRI machines, ventilator machines, cardiac monitor and other devices by connecting them to the internet. It proves to be very helpful as working medical equipment can make a difference between life and death.

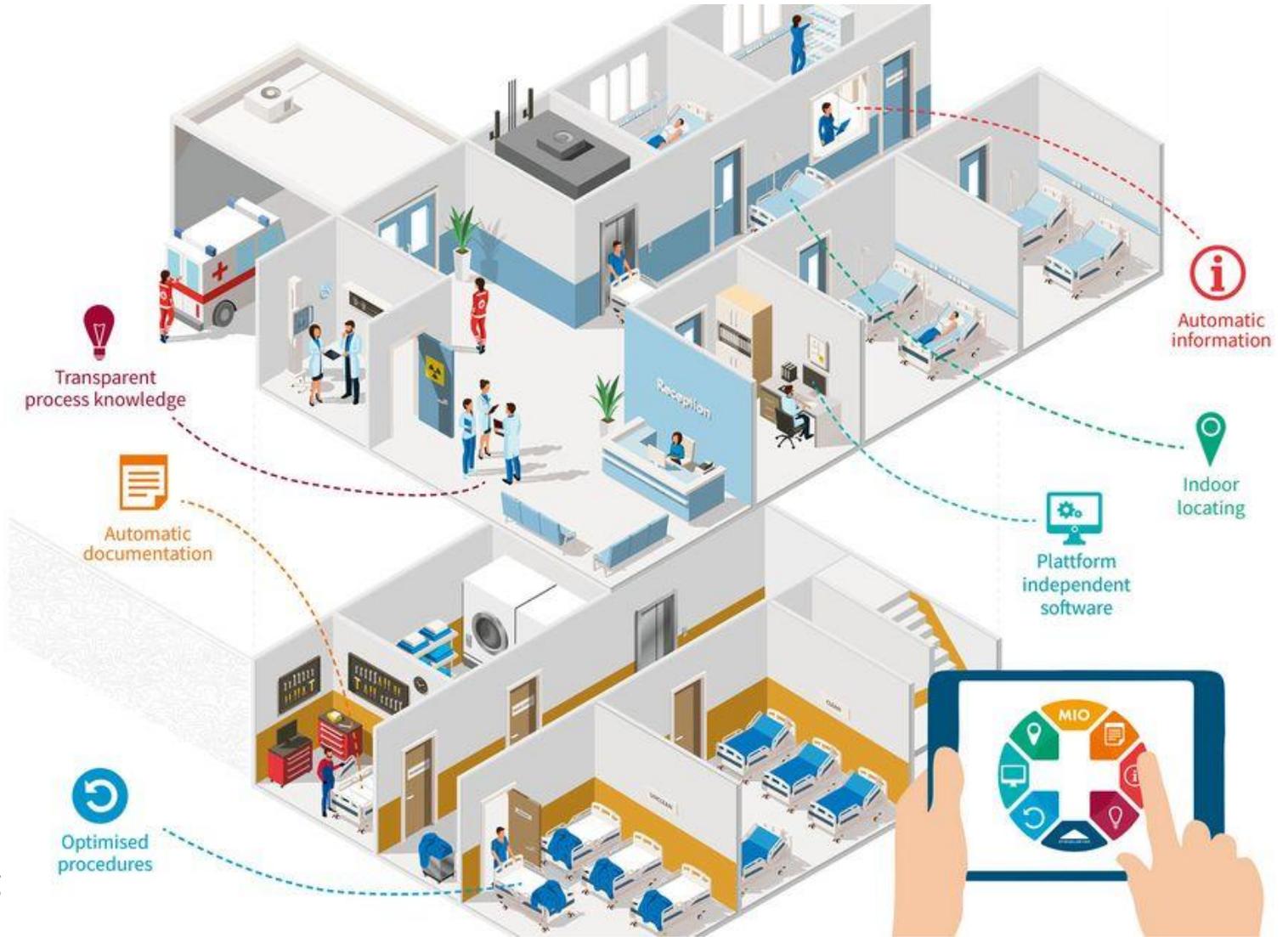


Photo from: stiegelmeier-forum

# How i4.0 is Transforming Industries?



## Agriculture

The agriculture sector is using i4.0 devices or equipment that is connected through i.4.0 such as smart water control pumps, chemical level monitors, etc. These smart types of equipment are used to check the soil and air quality fit for agriculture. i4.0 in agriculture allows making real-time changes and thus raising effectiveness in the process. Farmers are using i4.0 techniques in order to produce more and fulfill the demand of growing populations.

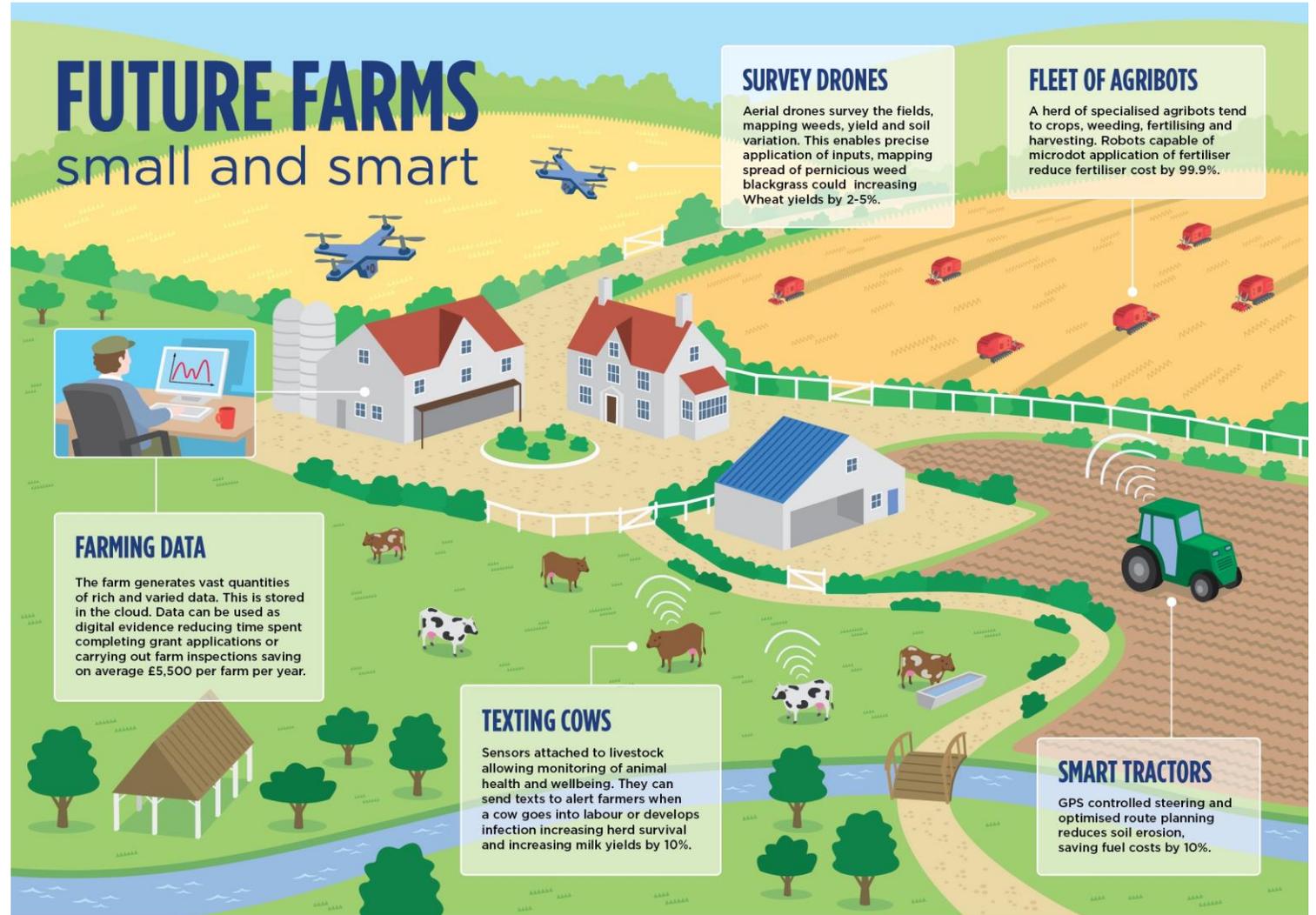
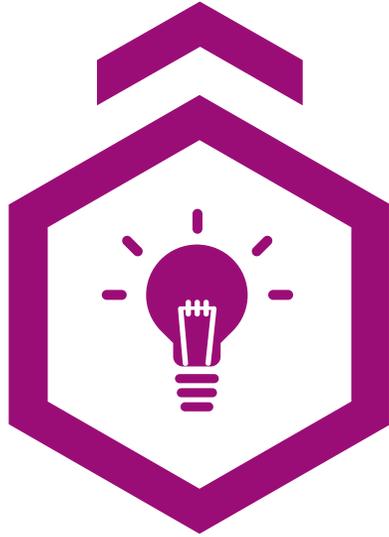


Photo from: nesta

# How i4.0 is Transforming Industries?



## Energy

The energy and utility sector is also using i4.0 technology to get better results. i4.0 devices are used by oil and gas companies to measure drilling lines. These devices optimize the process and minimize the expenditure by measuring the speed of the drilling procedure. The smart energy grid is a popular innovation that relies upon i4.0 devices that ensure the communication between the energy grid and consumer over an internet connection. The use of i4.0 technology in the energy sector not only saves money but also saves time and energy.

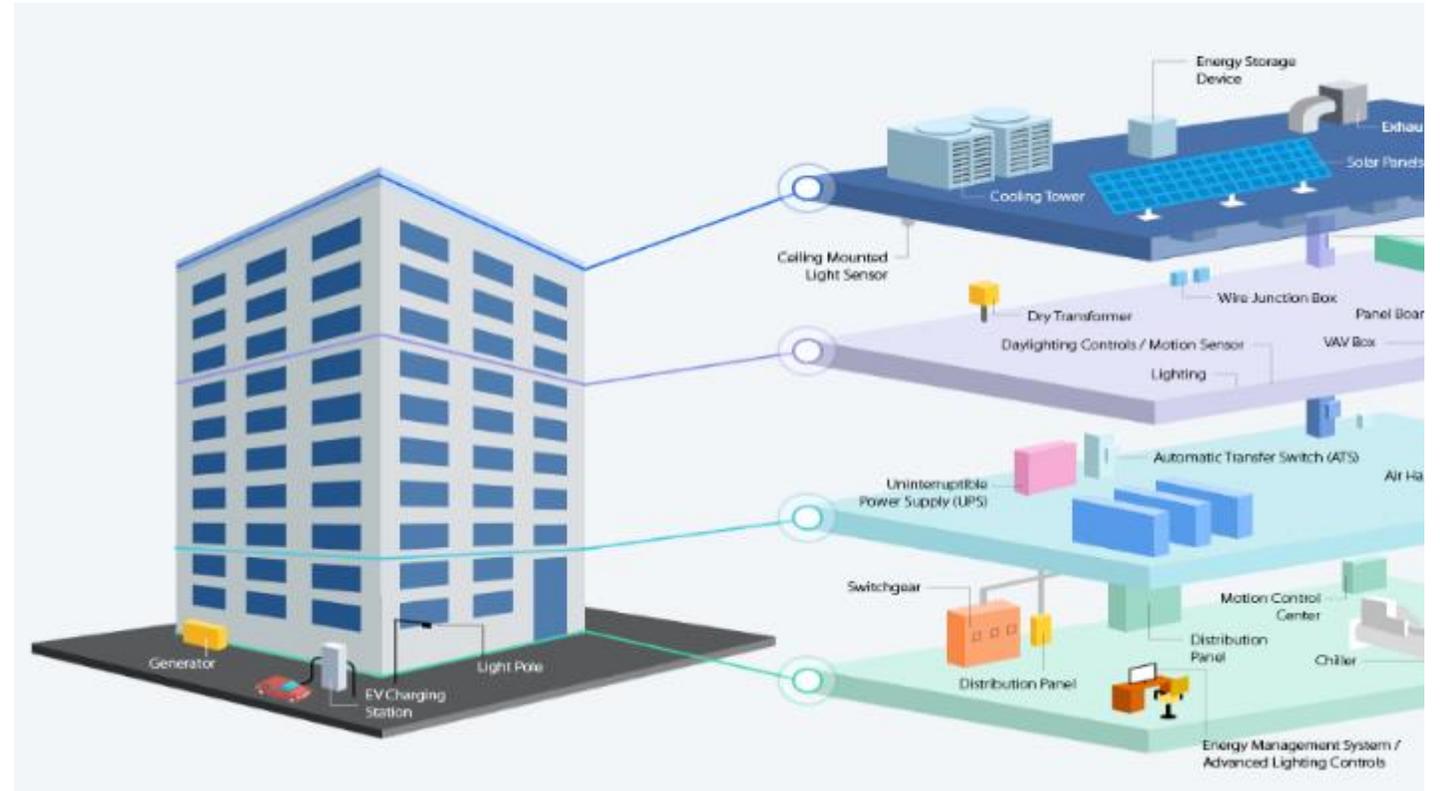


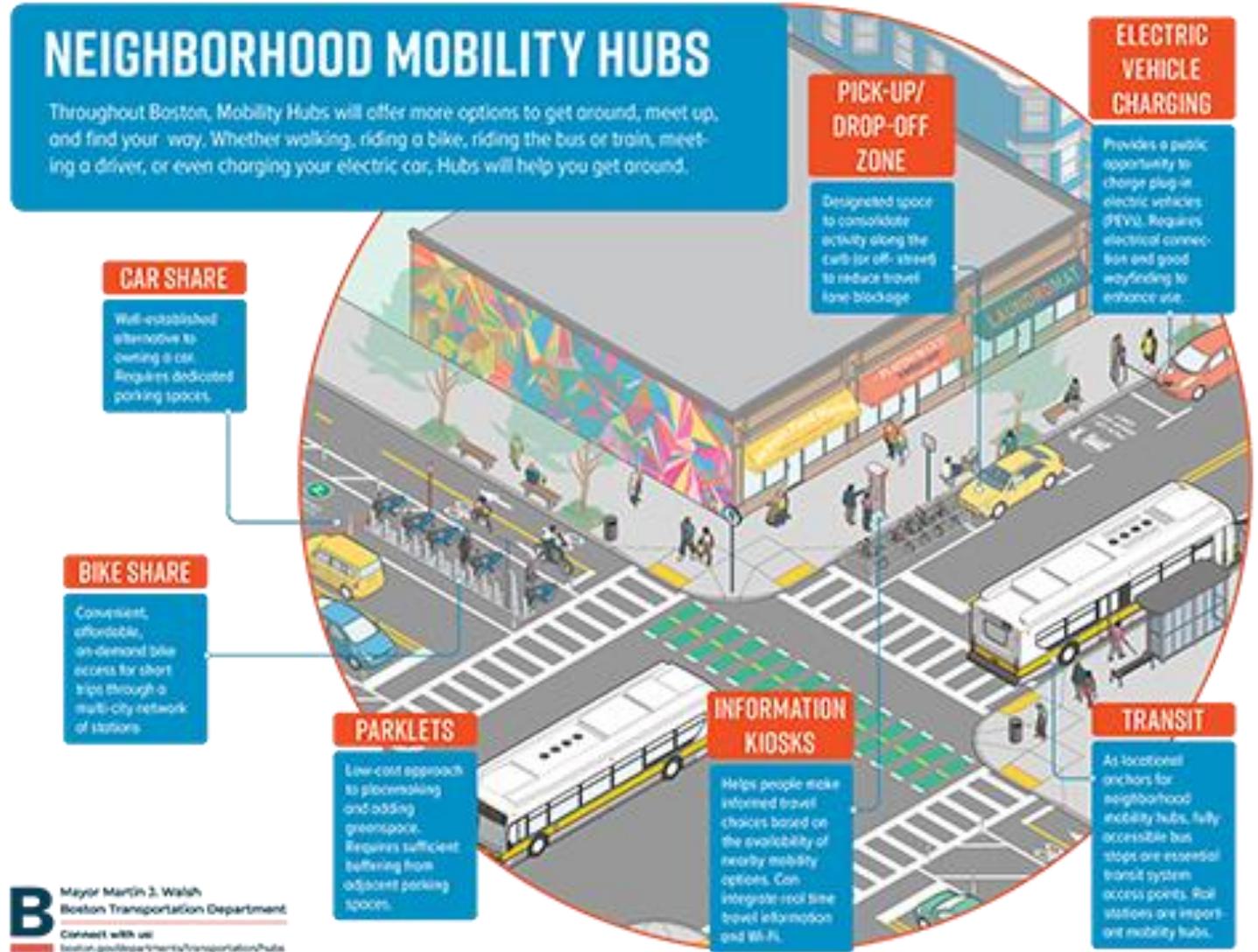
Photo from: cloud4things

# How i4.0 is Transforming Industries?



## Transportation

IoT technology is being used in the transportation and logistics industry to provide better business experiences. By connecting shipping vehicles with sensors to monitor temperature, companies can help ensure goods, especially food, arrive in a safe condition. Sensors and smart software can also be used in a semi-truck or public bus to collect data that can be used to help the driver operate the vehicle in a manner that helps save fuel.



# How i4.0 is Transforming Industries?



## Manufacturing

IoT is not a new concept for the manufacturing industry. Many manufacturing plants are using machine learning and smart sensors in their manufacturing process.

Manufacturing units are using IoT in order to optimize their manufacturing process, monitoring and maintenance of equipment. IoT in manufacturing is used to track factory assets to increase analytics functionality. Now manufacturing companies are working on '**smart manufacturing**' patterns to enhance the productivity and efficiency of manufacturing operations..



Photo from: dreamstime

# Is your Company Ready for Industry 4.0?

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i4.0 technology brings many advantages such as 360 degree visibility of the entire factory and the ability to convert physical data to digital data so that you can share and analyze it. With i4.0, you can significantly reduce bottlenecks, and increase supply chain flexibility and customer satisfaction.

Many manufacturers rely on legacy systems, which can be made i4.0 compatible, in fact i4.0 tech may actually extend the lifetime of legacy equipment. But as you may have realized, before implementing a change, assessing your factory's needs, readiness, and the state of legacy and IT infrastructure, as well as your strategic objectives is the critical first step.

But where should you start and is your business Industry 4.0 ready?



*“The truth is no manufacturer can afford to ignore i4.0 anymore: Upgrading to i4.0 will yield an estimated average efficiency increase of 18% alongside a 13.8% drop in costs over the next five years.” – Source: **magic software***

## Smarter Industry: Better ROI

Digital transformation in the Industry 4.0 era will improve the competitiveness of industrial organizations, while at the same time boosting their ability to take optimal decisions.

- **Predictive Maintenance**

In order to optimize Equipment Efficiency (OEE), enterprises are transitioning to predictive maintenance, which is the ultimate industrial maintenance vision. In predictive maintenance, machines are able to predict and anticipate their failures, through accurately calculating parameters such as their End of Life (EoL) and Mean Time To Failure (MTTF).

- **Quality Control**

IIoT and Big Data technologies enable the collection of abundant data about industrial processes, which gives rise to accurate detection of quality problems at various timescales. For example, digital data about a production line can be collected and used to identify problems and inefficiencies, while recommending remedial actions. This enables quality management disciplines like Total Quality Management (TQM) and ZDM (Zero Defect Manufacturing).



# Smarter Industry: Better ROI

- **Mass customization**

Manufacturing is moving from an era of mass production to an era of mass customization which can drive ROI by shortening the supply chain, localizing manufacturing and even improving customer satisfaction.

- **Cost Savings**

Reduce the amount of capital used in manufacturing process, and cut costs by reducing raw materials and energy consumption.

- **Flexibility**

IIoT facilitates the convergence of OT with IT and enables the reconfiguration of industrial automation processes based on digital tools and at shorter timescales (e.g., in few hours instead of weeks).

- **Connected Plants & Supply Chain Optimization**

IIoT technologies interconnect devices, CPS systems and business information systems (e.g., ERP (Enterprise Resource Planning) and PLM (Product Lifecycle Management) systems) from all supply chain stakeholders, while at the same time enabling seamless flow of information across plants, logistics enterprises, customers and more.



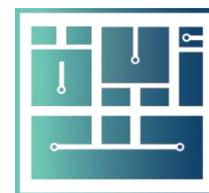
## I4.0 Makes Difference

Industry 4.0 are designed to change the whole equation of manufacturing by providing greater agility without sacrificing the quality, cost and speed. Let's discuss some of the advantages that Industry 4.0 brings along to manufacturing.



- **Efficiency** – The Industry 4.0 bring in automation, which means fewer people. Therefore the decision making is faster, and the end product is of high quality and boosts efficiency.
- **Agility** – When the product is aware of its specification, the manufacturing process is accelerated. Industry 4.0 builds that intelligence in the system and fosters agility.
- **Innovation** – When the manufacturing unit can accommodate new product introduction and experimentation in design, it creates a space for change. Industry 4.0 production line enables more in-depth understanding of both product and process design.
- **Customer Experience** – Industry 4.0 provides comprehensive information and responsiveness available to manufacturers, thus allowing them to serve their customers better.
- **Costs** – Industry 4.0 requires an initial investment. Once the intelligence I built in the process and the product, the cost will scale down to negligible.
- **Revenues** – Industry 4.0 can only promise to put the manufacturer in the limelight of the best suppliers list. This opens ways to serve the larger market, offer higher margin exceptional products, and operations that provide services to accompany these products.

# 4. INDUSTRY



**iken**

 [www.iken.co](http://www.iken.co)

 [Info@iken.co](mailto:Info@iken.co)

 [ikenco](https://www.linkedin.com/company/ikenco)

 Ikenco

 Ikenco

 (+202)228138780

 187, Sector 2 OLA Energy Building , 5th Floor , 5th Settlement Cairo EG

