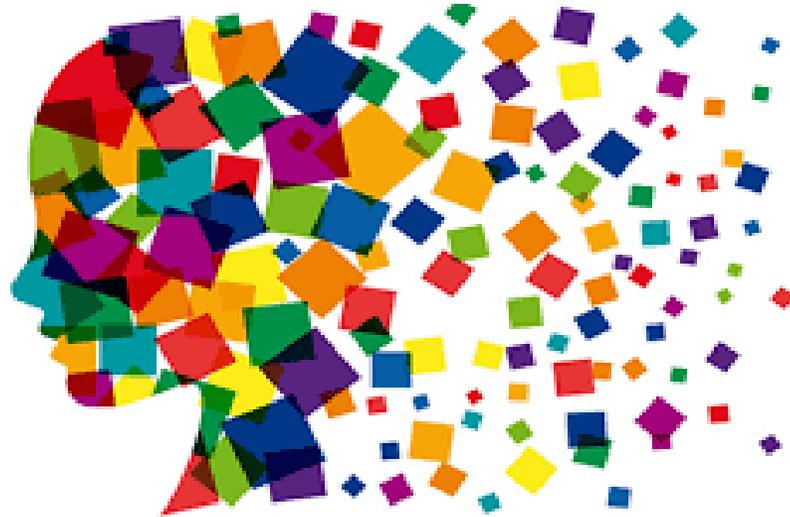


# Industrial Digitalisation 4.0



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# What is Digitalisation?

*To some, Digitalisation is about cyber security and using data in smarter ways to gain insight for better decisions.*



## Definitions

Industry 4.0 according to BDI (the German industry voice)

<https://english.bdi.eu/article/news/what-is-industry-40/>

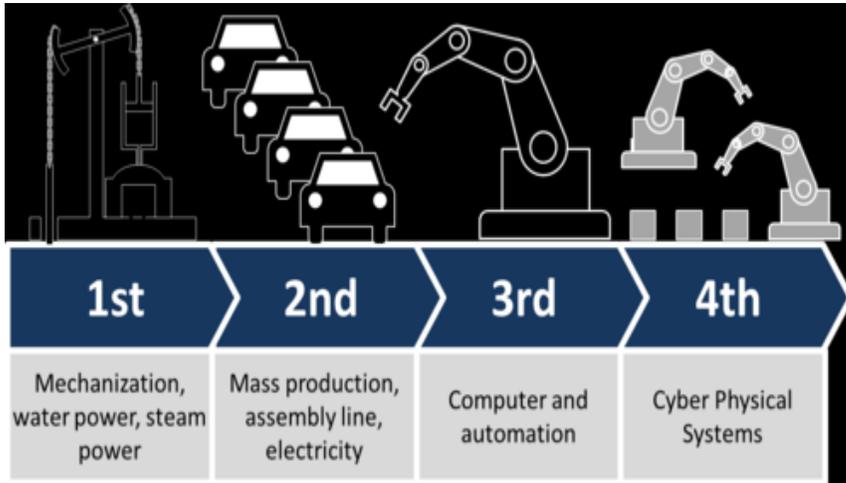
Industry 4.0 refers to the fourth industrial revolution. After mechanisation (Industry 1.0), mass production (Industry 2.0) and automation (Industry 3.0), now the “internet of things and services” is becoming an integral part of manufacturing. Industry 4.0 technologies have the potential to create extraordinary growth opportunities and competitive advantages for Germany as a business location. Experts forecast that businesses will be able to increase their productivity by about 30 percent using Industry 4.0.



Industry 4.0 according to McKinsey

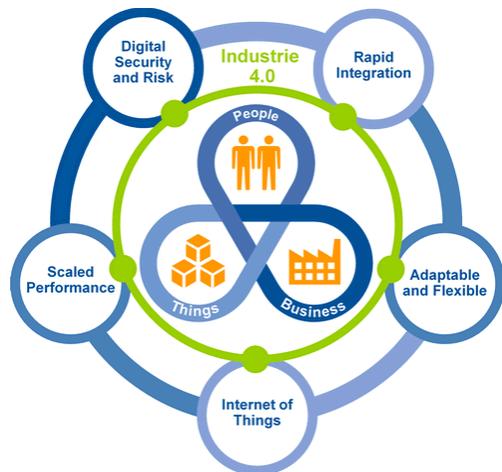
<https://www.mckinsey.com/business-functions/operations/our-insights/manufacturings-next-act>

Industry 4.0 is the next phase in the digitization of the manufacturing sector, driven by four disruptions: the astonishing rise in data volumes, computational power, and connectivity, especially new low-power wide-area networks; the emergence of analytics and business-intelligence capabilities; new forms of human-machine interaction such as touch interfaces and augmented-reality systems; and improvements in transferring digital instructions to the physical world, such as advanced robotics and 3-D printing.



Industry 4.0 according to Wikipedia  
[https://en.wikipedia.org/wiki/Industry\\_4.0](https://en.wikipedia.org/wiki/Industry_4.0)

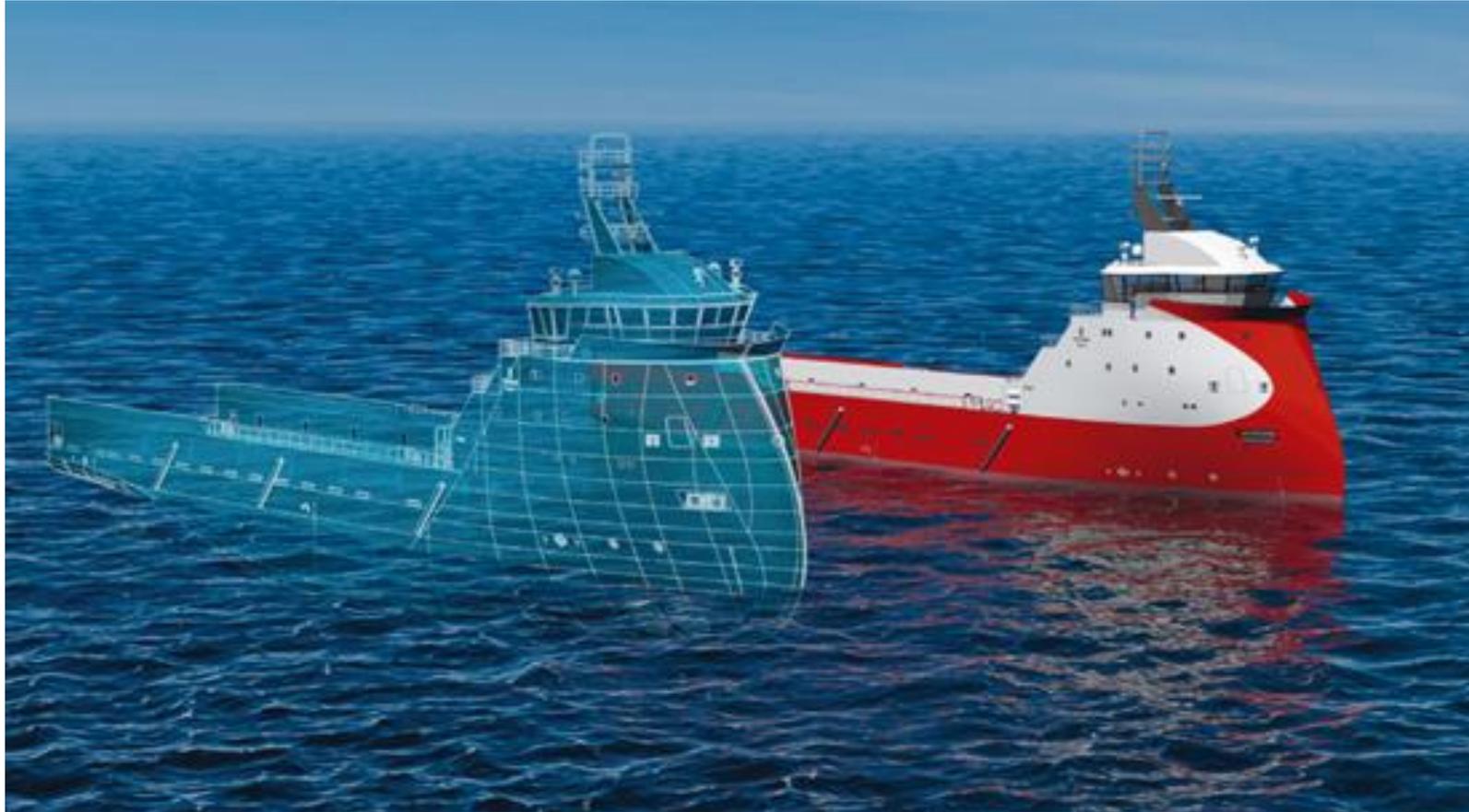
Industry 4.0 is the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things and cloud computing. Industry 4.0 creates what has been called a "smart factory".



Industry 4.0 (or the original German 'Industrie 4.0') according to Gartner  
<https://www.gartner.com/newsroom/id/3054921>

Industrie 4.0 is a German-government-sponsored vision for advanced manufacturing. The underlying concept of Industrie 4.0 is to connect embedded systems and smart production facilities to generate a digital convergence between industry, business and internal functions and processes. Industrie 4.0 refers to a fourth industrial revolution (following water/steam power, mass production and automation through IT and robotics) and introduces the concept of "cyber-physical systems" to differentiate this new evolutionary phase from the electronic automation that has gone before.

# Digital Twins



# Opportunities with digital twin technologies

The momentum on **Internet of Things (IoT)** is turning advanced sensor equipment into a commodity rather than a proprietary and rather expensive solution

**Everything is connected**....or will be connected. According to a recent Gartner-report, we will see 6.4 billion connected “things” and a sharp increase of 30% compared to 2015. Most ships, systems, and components will be linked to the Internet, making them accessible from almost any location.

We are well into the 4th industrial revolution and the **connectivity** makes it possible to collect and analyse data and provide the derived insights immediately

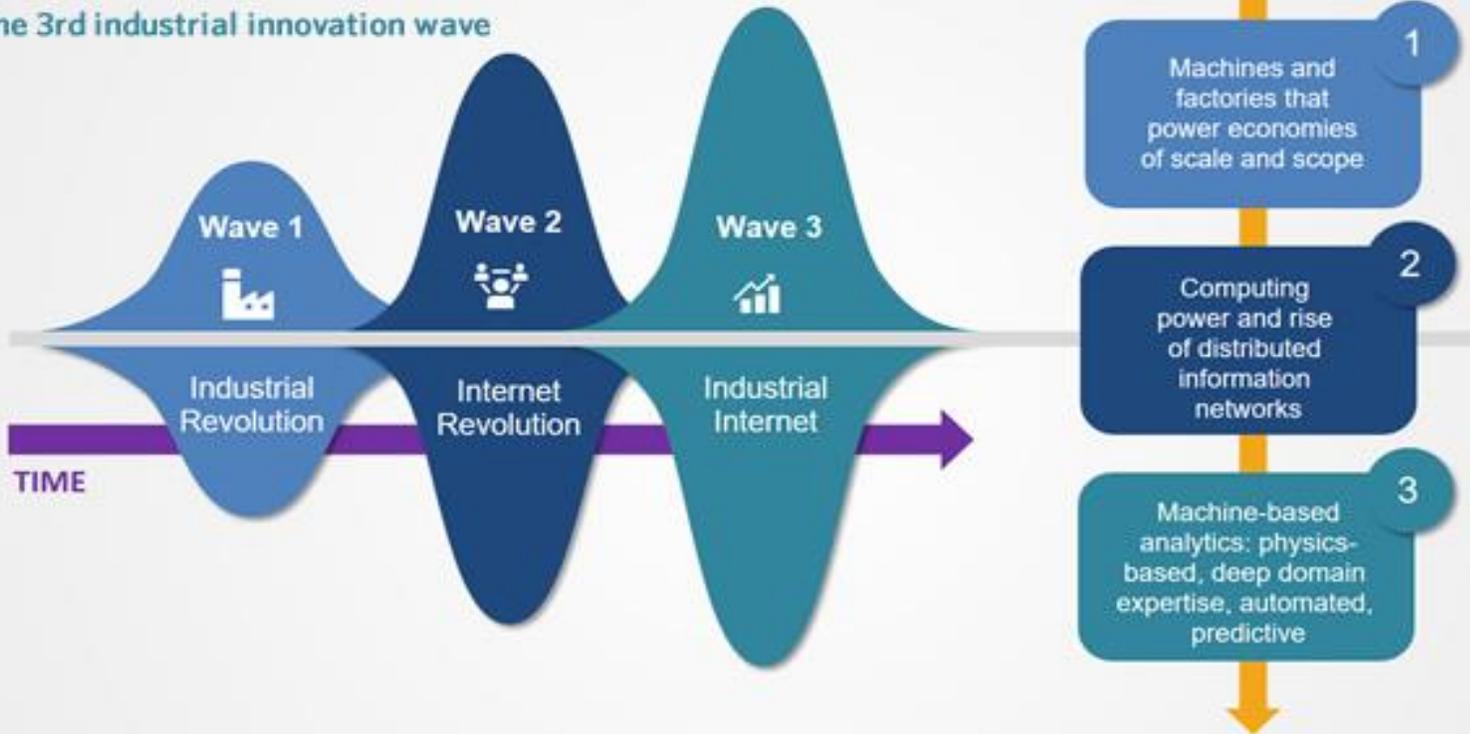
Various companies like Microsoft, Google, Amazon and so on have an impressive momentum towards hyper-scale computing, so you will soon have **“unlimited” storage and compute power for a limited cost**. All the plumbing work with regards to setting up local clusters, networks and storage accounts is history. You have IaaS or Infrastructure as a Service instead.

**Artificial intelligence, cognitive services, big data analysis, machine learning, predictive maintenance** and so on also becomes (or is) readily available on multiple platforms.

Big data, automation of knowledge work, advanced analytics, internet of things and connectivity creates a vast amount of opportunities and potential new business and service models.

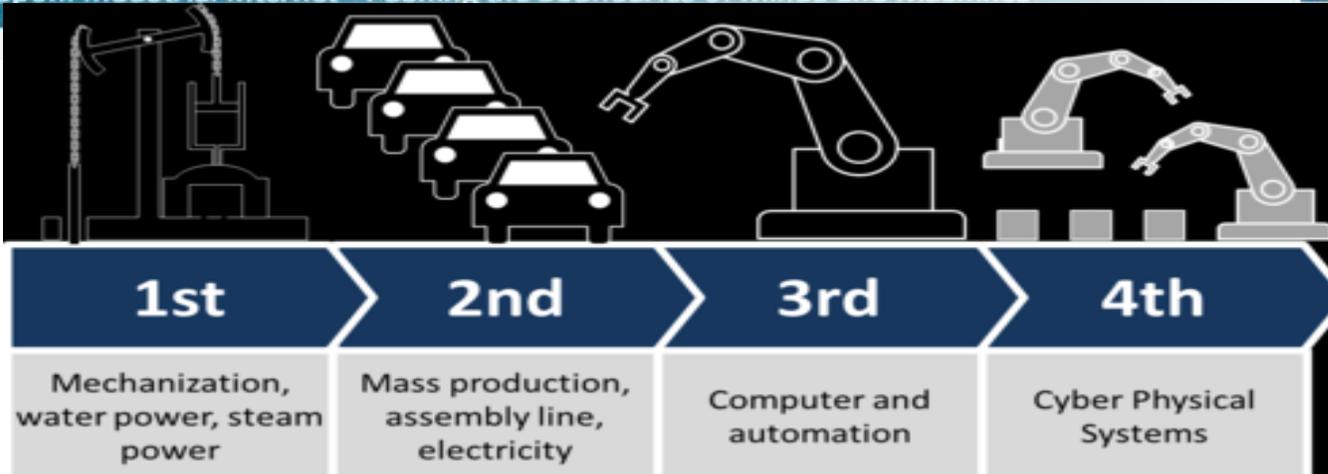
# The Industrial Internet

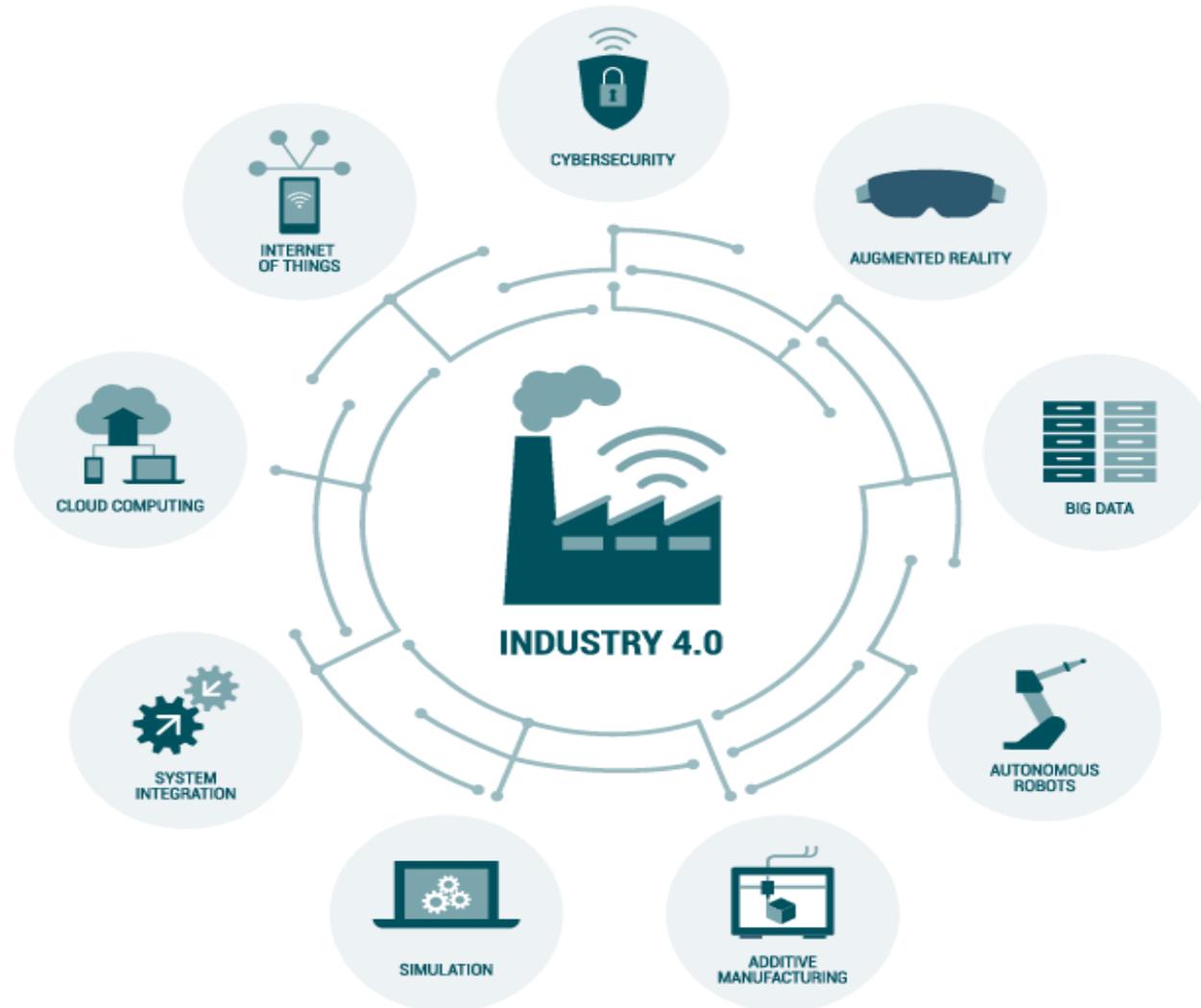
- the 3rd industrial innovation wave



[slideshare.net/GE\\_MC\\_India/industrial-internet-pushing-the-boundaries-of-minds-and-machines](https://www.slideshare.net/GE_MC_India/industrial-internet-pushing-the-boundaries-of-minds-and-machines)

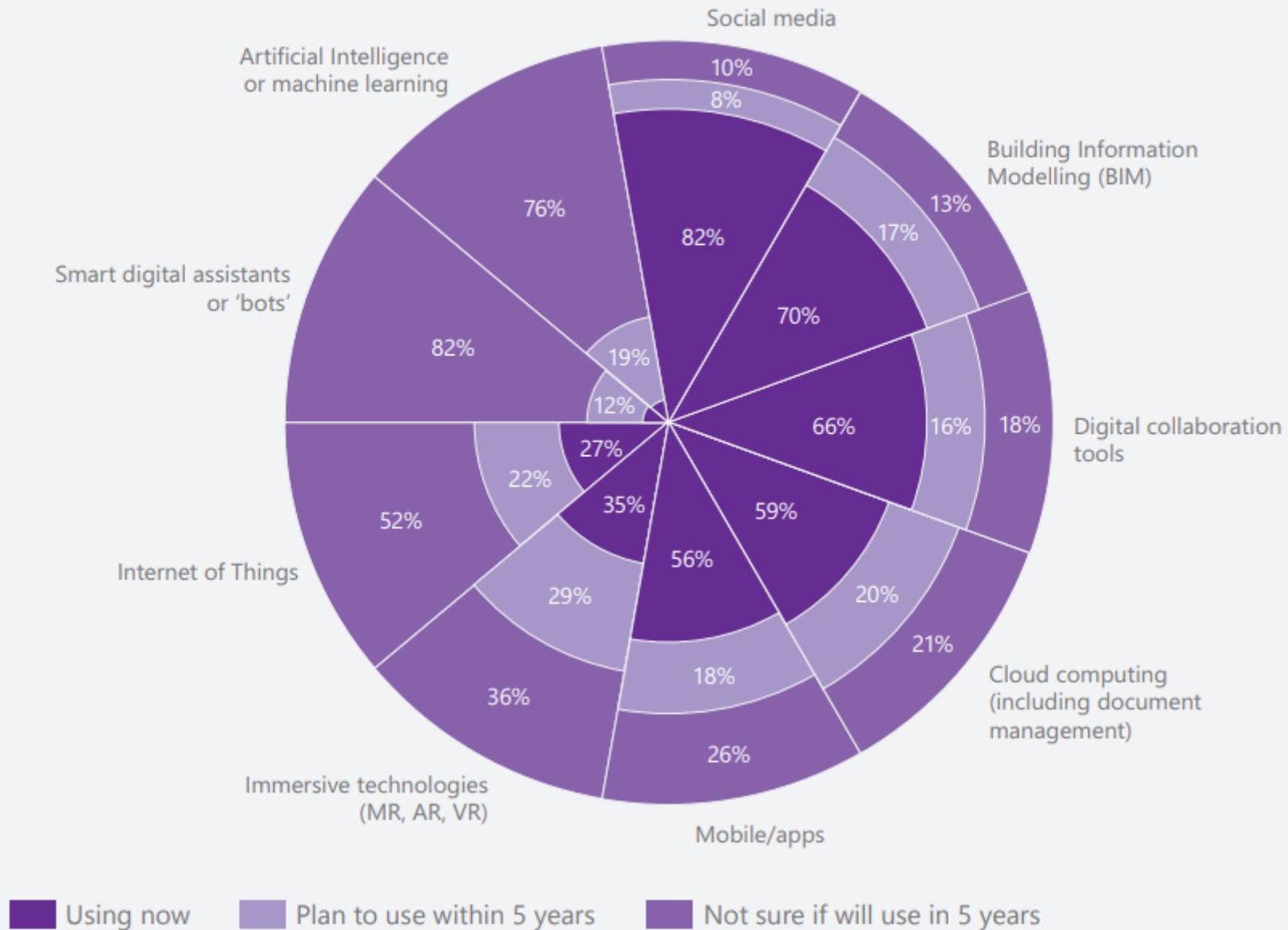
Based upon: Industrial Internet - Pushing the Boundaries of Minds and Machines





The technologies helping to transform UK architecture

## What digital technologies are you using or planning to invest in?



# Industry 4.0 - a staged approach with value opportunities at each step



## INDUSTRIE 4.0

Value and Industry 4.0 maturity

**What is happening?**

- Connect to gather
- Sensing, monitoring
- Big data, right data
- Data to information
- Machines, networks, processes

**Why is it happening?**

- Intelligence and understanding
- From information to knowledge
- Patterns and transparency
- AI, cognitive, analytics and analysis

**What will happen?**

- Predictive capability
- From knowledge to wisdom to forecast
- Preparedness and preparation
- More AI and cognitive
- Maintenance, innovation, service

**Autonomous action?**

- Autonomous action and machines
- Self-optimizing systems
- From wisdom to (re)action
- From forecast to production
- Agility, flexibility, true innovation
- Transformation

Industry 4.0 vision

Stage 1: See      Stage 2: Understand      Stage 3: Prepare      Stage 4: Adapt autonomous

Industry 4.0 development and roadmap - each stage as an enabler



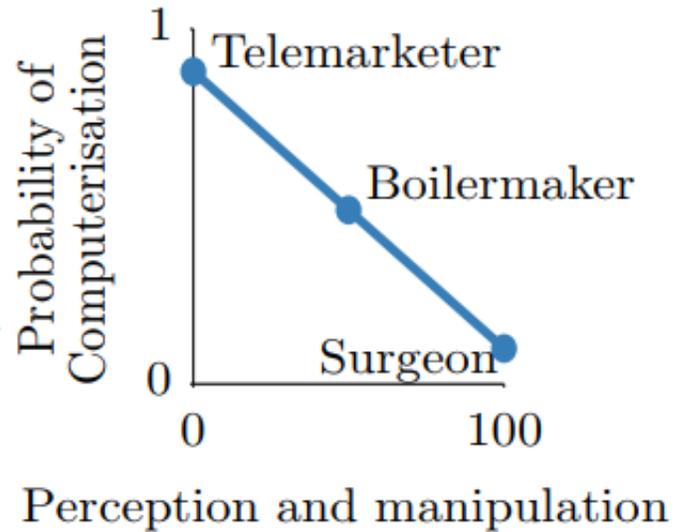
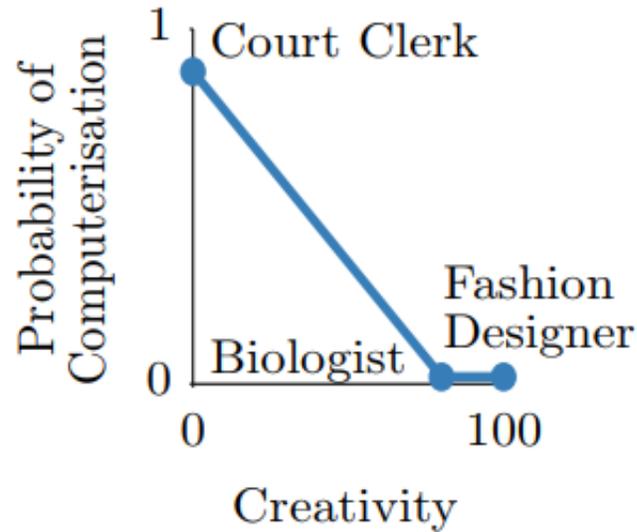
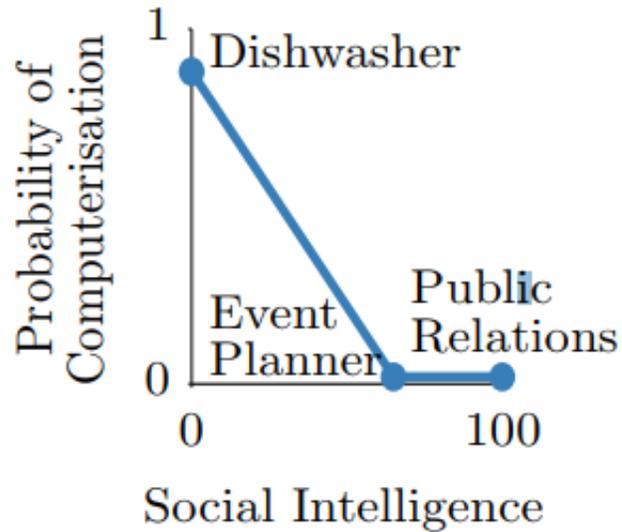
Value opportunity      Value opportunity      Value opportunity      Value opportunity

Value opportunities at each stage and leading to higher overall value across the journey



What else is there for  
ID 4.0 in terms of  
skills?

We take a job's automatability to be a function of the skills required to complete the task.



# Soft Skills



## Top 10 skills

### in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

### in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity



Source: Future of Jobs Report, World Economic Forum

# Blog

## Industrial Digitalisation at University of Lincoln

<https://digitalisation.wordpress.uat.lincoln.ac.uk/>