2017

4th Industrial Revolution

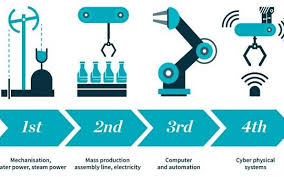


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# What Is the Fourth Industrial Revolution?

# What exactly is the Fourth Industrial Revolution?

# The Fourth Industrial Revolution is a way of describing the blurring of boundaries between the physical, digital, and biological worlds.

It’s a fusion of advances in artificial intelligence (AI), robotics, the Internet of Things (IoT), 3D printing, genetic engineering, quantum computing, and other technologies. It’s the collective force behind many products and services that are fast becoming indispensable to modern life. Think GPS systems that suggest the fastest route to a destination, voice-activated virtual assistants such as Apple’s Siri, personalized Netflix recommendations, and Facebook’s ability to recognize your face and tag you in a friend’s photo. As a result of this perfect storm of technologies, the Fourth Industrial Revolution is paving the way for transformative changes in the way we live and radically disrupting almost every business sector.

## Where did the term “Fourth Industrial Revolution” come from?

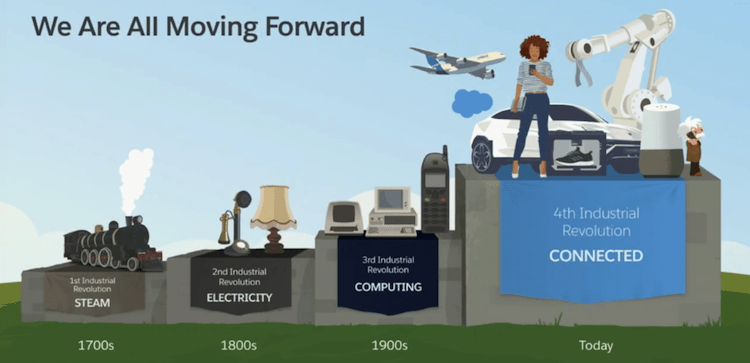
While the Fourth Industrial Revolution (sometimes called the 4IR or Industry 4.0) is set to change society like never before, it builds on foundations laid by the first three industrial revolutions. The advent of the steam engine in the 18th century led to the first industrial revolution, allowing production to be mechanized for the first time, and driving social change as people became increasingly urbanized

Figure 1

Figure 2

 In the second industrial revolution, electricity and other scientific advancements led to mass production. A third industrial revolution, beginning in the 1950s, saw the emergence of computers and digital technology. This led to the increasing automation of manufacturing and the disruption of industries including banking, energy, and communications.

The person who labelled today’s advances as a new revolution was Klaus Schwab and author of a book titled [The Fourth Industrial Revolution](https://luminariaz.files.wordpress.com/2017/11/the-fourth-industrial-revolution-2016-21.pdf). In a 2016 article, [Schwab wrote](https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/) that “like the revolutions that preceded it, the Fourth Industrial Revolution has the potential to raise global income levels and improve the quality of life for populations around the world.” (Placeholder1)

He continued: “In the future, technological innovation will also lead to a supply-side miracle, with long-term gains in efficiency and productivity. Transportation and communication costs will drop, logistics and global supply chains will become more effective, and the cost of trade will diminish, all of which will open new markets and drive economic growth.”

 It’s not all good news, however. Schwab also suggested the revolution could lead to greater inequality, “particularly in its potential to disrupt labor markets.” Furthermore, the job market may become increasingly segregated into “low-skill/low-pay” and “high-skill/high-pay” roles, which could escalate social tension.

According to Schwab, “the changes are so profound that, from the perspective of human history, there has never been a time of greater promise or potential peril.”

# What are the technologies driving change?

The easiest way to understand the Fourth Industrial Revolution is to focus on the technologies driving it. These include the following:

Artificial intelligence (AI) describes computers that can “think” like humans — recognizing complex patterns, processing information, drawing conclusions, and making recommendations. AI is used in many ways, from spotting patterns in huge piles of unstructured data to powering the autocorrect on your phone.

Blockchain is a secure, decentralized, and transparent way of recording and sharing data, with no need to rely on third-party intermediaries. The digital currency Bitcoin is the best known blockchain application. However, the [technology can be used in other ways](https://www.salesforce.com/company/news-press/stories/2018/11/110918/), including making supply chains traceable, securing sensitive medical data anonymously, and combating voter fraud.

New computational technologies are making computers smarter. They enable computers to process vast amounts of data faster than ever before, while the advent of the “cloud” has allowed businesses to safely store and access their information from anywhere with internet access, at any time. Quantum computing technologies now in development will eventually make computers millions of times more powerful. These computers will have the potential to supercharge AI, create highly complex data models in seconds, and speed up the discovery of new materials.

**Virtual reality (VR**) offers immersive digital experiences (using a VR headset) that simulate the real world, while augmented reality merges the digital and physical worlds. Examples include [L’Oréal’s makeup app](https://www.salesforce.com/ap/customer-success-stories/loreal/), which allows users to digitally experiment with makeup products before buying them, and the Google Translate phone app, which allows users to scan and instantly translate street signs, menus, and other text.

**Biotechnology** harnesses cellular and biomolecular processes to develop new technologies and products for a range of uses, including developing new pharmaceuticals and materials, more efficient industrial manufacturing processes, and cleaner, more efficient energy sources. [Researchers in Stockholm](https://pubs.acs.org/doi/10.1021/acsnano.8b01084), for example, are working on what is being touted as the strongest biomaterial ever produced.

**Robotics** refers to the design, manufacture, and use of robots for personal and commercial use. While we’re yet to see robot assistants in every home, technological advances have made robots increasingly complex and sophisticated. They are used in fields as wide-ranging as manufacturing, health and safety, and human assistance.

**3D printing** allows manufacturing businesses to print their own parts, with less tooling, at a lower cost, and faster than via traditional processes. Plus, designs can be customized to ensure a perfect fit.

**Innovative** materials, including plastics, metal alloys, and biomaterials, promise to shake up sectors including manufacturing, renewable energy, construction, and healthcare.

**The IoT** describes the idea of everyday items — from medical wearables that monitor users’ physical condition to cars and tracking devices inserted into parcels — being connected to the internet and identifiable by other devices. A big plus for businesses is that they can collect customer data from constantly connected products, allowing them to better gauge how customers use products and tailor marketing campaigns accordingly. There are also many industrial applications, such as farmers putting IoT sensors into fields to monitor soil attributes and inform decisions such as when to fertilize.

**Energy capture**, storage, and transmission represent a growing market sector, spurred by the falling cost of renewable energy technologies and improvements in battery storage capacity.

# How will the Fourth Industrial Revolution affect business?

As these technologies change what’s possible, they’re also transforming customers’ expectations. A [global survey from Salesforce Research](https://www.salesforce.com/form/pdf/state-of-the-connected-customer-2nd-edition/?d=7010M000000uQVWQA2) shows that a majority of those surveyed believe that these technologies — and the experiences they enable — will transform their interactions with companies within five years.

## How to prepare for a career in the 4th Industrial Revolution.



Figure 3

The world is changing fast - faster than ever before, even jobs that first emerged barely a generation ago are no longer around.

DURBAN – The world is changing fast - faster than ever before, even jobs that first emerged barely a generation ago are no longer around.

Today changes are monumental job market: by 2022 over 75 million jobs will have disappeared and replaced by 133 million new types of jobs (WEF, 2018). This is because of the 4th Industrial Revolution, which refers to how high-level technologies are enhancing our world. It’s a future that could have driverless cars, drone deliveries and shops run by artificial intelligence. That’s why so many jobs will disappear, and new ones will be created.

This can make students today anxious about their tertiary education choices. What guarantee do they have that their pick will be a good one for the future? Here are four tips that will help cover those bases and guide you to the best options:

Get into STEM: In the future STEM (Science, Technology, Engineering and Mathematics) will be a part of everything, because it is the foundation of the 4th Industrial Revolution. That doesn’t mean you need a PhD in science to play a part. STEM can however help you see where you can do the most with your abilities and interests. STEM actually covers an enormous number of careers that aren’t in the ‘classic’ brackets of their names. For example, a designer of visual elements for an application is still part of the technology world. Visit STEM seminars and speak to people in careers you’re considering about STEM to discover more.

Soft skills are the top skills: Machines can do many wonderful things, but they are not much good at creativity, empathy and a host of other human attributes that makes each of us unique. This is popularly called EQ or ‘soft skills. EQ will be very important for future jobs. Working with others, managing disagreements, inspiring co-workers and collaborating for better results are benchmarks that matter more every day. There are many books and online resources about soft skills, so start there. An integrated and supportive learning environment can also help develop these skills.