

How Will the Fourth Industrial Revolution Change Your World?

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Industry 4.0 is ramping up. What does that mean for your job?



Nearly every industry today—from manufacturing to services—relies on technical systems for its functioning. In most cases, multiple aspects of a single business or supply chain are dependent on different types of devices and software.

In an ordinary industrial landscape inundated with such systems, keeping track of multiple technical components can be a herculean task.

But what if all the diverse technologies that a business uses came together to form a single, overarching operation? Not only would things run smoother, but also a lot more efficiently than ever before. Well, Industry 4.0 has done just that.

What is Industry 4.0?

Industry 4.0 is the fourth major overhaul of modern industry and is characterized by the integration of smart technology in supply chains and businesses. It is also referred to as the Fourth Industrial Revolution owing to its groundbreaking role in industries today.

The interlinked technology utilized as a part of the Industry 4.0 movement fulfills the need for connectedness and access to real-time insights across products, processes, and people.

Whereas industries in the early 20th century used central control systems, Industry 4.0 serves the demand for technological integration by the use of decentralized smart tech capable of analyzing, evaluating, and executing decisions autonomously.

But why is it called the Fourth Industrial Revolution? What were the first three about?

A Brief Overview of Industrial Revolutions

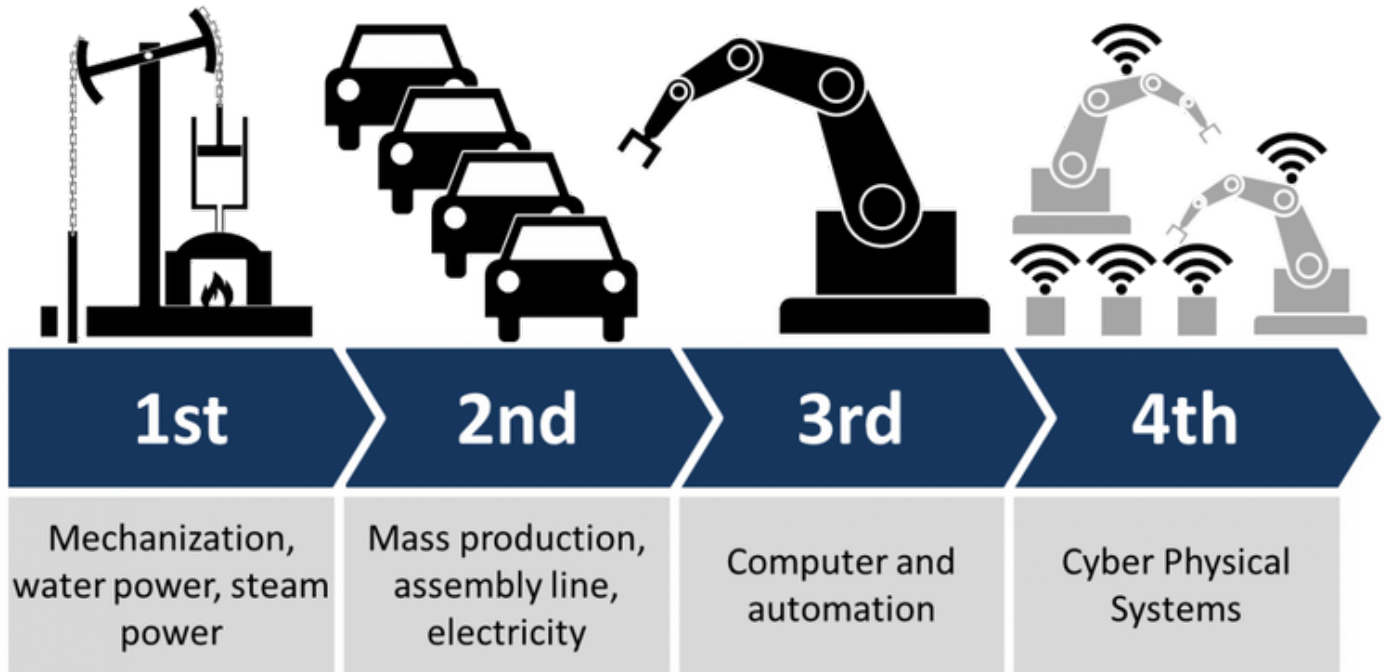
Industrial revolutions have, over centuries, shaped modern society. Every iteration is characterized by the introduction of advanced technology and the subsequent restructuring of industries to accommodate it.

The three significant industrial revolutions before Industry 4.0 were:

- **First Industrial Revolution:** Here, a shift in focus from manual labor to instruments and steam engines gave birth to modern industry. Throughout the 18th century, economically productive practices worldwide began to recognize and embrace the role of machinery in manufacturing.
- **Second Industrial Revolution:** With the introduction of elements such as steel and electricity in manufacturing in Industry 2.0, businesses

were able to improve the speed and scale of their activities radically.

- **Third Industrial Revolution:** Also known as the period where automation was born, Industry 3.0 in the 1950s set a precedent for developing supply chains, assembly lines, and computerization of manufacturing processes.



Today, Industry 4.0 goes further than any of its predecessors when it comes to its implications. It takes the emphasis on digital technology from recent decades to a whole new level with the help of interconnectivity through the Internet of Things (IoT), access to real-time data, smart computing, and the introduction of cyber-physical systems.

Other instrumental technologies include 3D printing, nanotechnology, quantum computing, [cloud computing](#), and energy optimization.

By taking the best of modern technology and putting it in a business ecosystem, Industry 4.0 has allowed for unprecedented precision and productivity in supply chains and manufacturing. This, in turn, has led to a host of benefits, both in the supply and demand-side in a variety of industries.

The success of Industry 4.0 would not be possible without its component

technologies. The wide array of tech solutions that businesses use today have brought us closer than ever before to blurring the boundaries between our physical, digital, and biological domains.

The Limbs of Industry 4.0

There is an unprecedented diversity of tech in this Industrial Revolution and an impressive manner in which each digital and physical system is implemented.



Here are the essential aspects, or limbs, of Industry 4.0.

Autonomous Equipment and Vehicles

The use of self-driving cranes and autonomous machinery has helped increase the pace of mechanical tasks in large-scale industrial processes.

Robotics

Once only financially viable for large-scale organizations, robotic technology has become more affordable and subsequently more widespread throughout Industry today. From performing exacting manufacturing tasks with precision to providing labor support to professionals, robots have proven themselves to be the backbone of modern industry.

Artificial Intelligence

AI-enabled software systems have enabled efficient decision making in complex cyber-physical systems with the help of real-time feedback collection and data analysis.

In structured 'smart' factories, AI has empowered physical systems to monitor processes and make decentralized decisions. AI is surprisingly ubiquitous, and you'll be surprised to find it being applied in areas.

Related: [Jobs You Never Knew Were Performed by AI](#)

Internet of Things

Arguably the most essential part of Industry 4.0, the use of IoT in Industry has allowed for the seamless integration of the wide array of technologies that businesses and supply chains use.

From small sensors to large machinery, the continuous transmission of feedback and instructions afforded by IoT fuels industry-wide cyber-physical systems that run the entire show.



Benefits of Industry 4.0

Industry 4.0 is sometimes also referred to as Industrial IoT (or [IIoT](#)) because it's built on wireless cyber-physical systems. From automated sensors to robotic machinery, every seemingly independent system is connected to a decentralized information-processing unit.

The most crucial benefits of such immense connectivity are increased data visibility, access to insights, and control of the entire supply chain.

Manufacturers have the ability to predict problems before they arise and perform preventive maintenance. Suppliers have the ability to analyze supply and demand and scale the flow of products. At the same time, retailers have the ability to track assets and optimize logistical variables such as quality and quantity.

The Future of Industry 4.0

There is no denying that the speed of today's Industry 4.0 breakthroughs

has no historical precedent. There are bound to be giant leaps in an already revolutionary period with a near-exponential growth in computing and processing power year-on-year.

One technology in particular that holds great promise for the near future is [Quantum Computing](#). Unlike regular computers that use physical transistors, quantum computers use quantum phenomena such as superposition to perform computation. Put simply, quantum computers are no longer bound by the physical limitations of conventional electronics.

As we move forward with this, the confluence of breakthroughs in technologies such as quantum computing and modern technical systems is bound to help Industry 4.0 leapfrog to unparalleled heights.

From helping modern industry transcend conventional limitations to enabling efficient scaling of businesses and supply chains, the possibilities of Industry 4.0 are truly immense. As for just how far it takes us, only time will tell.

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Yash is an aspiring computer science student who loves to build things and write about all things tech. In his free time, he likes to play Squash, read a copy of the latest Murakami, and hunt dragons in Skyrim.

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