

The impact of 4IR technology advancement on the engineering sector

By [Aadil Patel](#)

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We are living in a connected society with technology changing the world around us, making it smarter, more autonomous and increasingly data-rich. This is the dawn of the fourth industrial revolution (4IR), and businesses who don't embrace this disruption simply will not survive.



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While many fear losing relevance in the 4IR, the work of engineers will remain valuable. In fact, it is engineering that will drive many of the 4IR's pending advancements.

What is the 4IR?

The first industrial revolution arrived when steam and water were used for production machinery; the second introduced electric power and mass production; then information technology allowed for automated industrial processes in the third industrial revolution. Today, the 4IR is being driven by digital technology and its ability to fuse physical, digital and even biological elements.

What makes the 4IR particularly revolutionary is its speed (everything happening at a much faster pace than ever before); breadth and depth (with a great number of radical changes are occurring simultaneously); and the complete transformation of entire systems.

Currently, the main drivers of change in the 4IR are:

- High-speed mobile internet
- Artificial intelligence (AI)
- Big data analytics
- Cloud technology
- Blockchain technology
- Biotechnology
- Internet of things (IoT)

How the 4IR advances the engineering industry

The 4IR will see the convergence of multiple digital fields, including (but not limited to) robotics, AI and machine learning, nanotechnology and biotechnology. As new technology emerges and new markets develop, the scope of engineering influence will continue to grow.

Key roles that engineers will need to play

We cannot begin to fully conceive the scope and progression of the 4IR. Nevertheless, listed below are some examples of the key roles that engineers will need to play in the 4IR:

- Forming nanotechnologies

- Developing machinery and robotics compatible with automation technology
- Crafting 3D printers that can be used for a wide range of components
- Building sustainable, self-driving cars
- Constructing smart tracking tools and systems
- Producing tools to be used in space
- Improving sustainable power technologies
- Designing drone technology for various industries
- Creating modern medical technology

Automated production = design-focused engineering

Although the 4IR will necessitate engineering of all types, there will be a shift towards a focus on design. With new technology (such as factory automation and 3D printing) starting to handle most production tasks, design work is left to human engineers.

The automation of production has already been proven to optimise workflows and reduce costs, ensuring greater production capacity. This presents the opportunity for surplus budget to be spent on other areas of development, such as robotics and biological engineering.

The impact of the 4IR on engineering jobs

A report by the World Economic Forum titled *The Future of Jobs* claims that engineering specialists in materials, biochemical, nanotech and robotics will become critically important to such industries by 2020. This means that some jobs will become less popular while others will become obsolete. Although we don't yet know which these will be, we can assume that the jobs that robots are unlikely or unable to perform will become more popular.

Embracing a digital future

The engineering workforce needs will be fundamentally changed by technology in the 4IR - old jobs will become redundant, new jobs will be born, cutting-edge tools will change work methods, and a connected workforce will allow for vast collaboration. With these new developments imminent, the engineers of today need to start adapting, committing to continually learning and upskilling.

It's safe to say that engineers are in the driving seat of the 4IR, forging an exciting new future for human society as a whole.

ABOUT AADIL PATEL

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