



# These Six New Technology Rules Will Govern Our Future

By Vivek Wadhwa

**T**echnology is advancing so rapidly that we will experience radical changes in society not only in our lifetimes but in the coming years. We have already begun to see ways in which computing, sensors, artificial intelligence, and genomics are reshaping entire industries and our daily lives.

As we undergo this rapid change, many of the old assumptions that we have relied on will no longer apply. Technology is creating a new set of rules that will change our very existence. Here are six:

## 1. Anything that can be digitized will be.

Digitization began with words and numbers. Then we moved into games and, later, into rich media such as movies, images, and music. We also moved complex business functions, medical tools, industrial processes, and transportation systems into the digital realm. Now we are digitizing everything about our daily lives: our actions, words, and thoughts. Inexpensive DNA sequencing and machine learning are unlocking the keys to the systems of life. Cheap, ubiquitous sensors are documenting everything we do and creating rich digital records of our entire lives.

## 2. Your job has a significant chance of being eliminated.

In every field, machines and robots are beginning to do the work of humans. We saw this first happen during the Industrial Revolution when manual production moved into

factories and many millions lost their livelihoods. New jobs were created, but it was a terrifying time. There was even a significant societal dislocation from which the Luddite movement emerged.

The movement to digitize jobs is well underway in low-salary service industries. Amazon relies on robots to do a significant chunk of its warehouse work. Safeway and Home Depot are rapidly increasing their use of self-service checkouts. Soon, self-driving cars will eliminate millions of driving jobs. We are also seeing legal aid jobs disappear as computer programs specializing in discovery eliminate the needs for legions of associates to sift through paper and digital documents. Soon, automated medical diagnosis will replace doctors in fields such as radiology, dermatology, and pathology.

The only refuge will be in fields that are creative in some way such as marketing, entrepreneurship, strategy, and advanced technical fields. New jobs we cannot imagine today will emerge, but they will not replace all the lost jobs. We must be ready for a world of perennially high unemployment rates. But don't worry—just read on.

## 3. Life will be so affordable that survival won't necessitate having a job.

Note how cellphone minutes are practically free and our computers have gotten cheaper and more powerful over the past decades. As technologies such as computing, sensors, and solar energy advance, their

costs drop. Life as we know it will become radically cheaper. We are already seeing the early signs of this. Because of the improvements in the shared-car and car-service market that apps such as Uber enable, a whole generation is growing up without the need or even the desire to own a car. Health care, food, telecommunications, electricity, and computation will all grow cheaper very quickly as technology reinvents the corresponding industries.

## 4. Your fate and destiny will be in your own hands as never before.

The benefit of the plummet in the costs of living will be that the technology and tools to keep us healthy, happy, well-educated, and well-informed will be cheap or free. Online learning in virtually any field is already free. Costs also are falling with mobile-based medical devices. We will be able to execute sophisticated self-diagnoses and treat a significant percentage of health problems using only a smartphone and smart-distributed software.

Modular and open-source kits are making DIY manufacturing easier so you can make your own products. DIYDrones.com, for example, lets anyone wanting to build a drone mix and match components and follow relatively simple instructions for building an unmanned flying device. With 3-D printers, you can create your own toys. Soon, these will allow you to “print”

common household goods and even electronics. The technology driving these massive improvements in efficiency will also make mass personalization and distributed production a reality. Yes, you may have a small factory in your garage, but your neighbors may have one, too.

### **5. Abundance will become a far bigger problem than poverty.**

With technology making everything cheaper and more abundant, our

problems will arise from consuming too much rather than too little. This is already in evidence in some areas, especially in the developed world, where diseases of affluence—obesity, diabetes, cardiac arrest—are the biggest killers. These plagues and the Western diet that causes them have quickly jumped to the developing world as well. Human genes adapted to conditions of scarcity are woefully unprepared for conditions of a caloric cornucopia. We can expect

this process only to accelerate as the falling prices of Big Macs and other products our bodies don't need are made available to all.

The rise of social media, the internet, and the era of constant connection are other sources of excess. Human beings have evolved to manage tasks serially rather than simultaneously. The significant degradation of our attention spans and precipitous increase in attention-deficit problems that we have already experienced are partially attributable to spreading our attention too thin. As the number of data inputs and options for mental activity continues to grow, we will only spread it thinner. So even as we have the tools to do what we need to, forcing our brains to behave well enough to get things done will become more and more of a chore.

### **6. The distinction between man and machine will become increasingly unclear.**

The controversy over Google Glass showed that society remains uneasy over melding man and machine. Remember those strange-looking glasses that people would wear that were recording everything around them? Google discontinued these because of the uproar, but miniaturized versions of these will soon be everywhere. Implanted retinas already use silicon to replace neurons. Custom prosthetics that operate with the help of software are personalized, highly specific extensions of our bodies. Computer-guided exoskeletons are going into use in the military in the next few years and are expected to become a common mobility tool for the disabled and the elderly.

We will tattoo sensors into our bodies to track key health indicators and transmit those data wirelessly to our phones, adding to the numerous devices that interface directly with our bodies and form informational and biological feedback loops. As a result, the greatest shift in our existence will be that the very idea of what it means to be human will change—it will become increasingly difficult to draw a line between human and machine. **N**

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