



Lifestyle Feature

Ten Things That Will Change The Way We Live

[Breckinridge Ely](#) 02.17.06, 12:30 AM ET

There are inventions that people can all benefit from, and then there are inventions that have truly altered the course of history. In the former category, the automatic coffee maker, for example, is a wonderful device: ingenious and capable of brewing some fine java. But had it never existed, it would not have really mattered. The same might be said for the microwave oven, the hair dryer, laser keratotomy, REITs, the Xbox and the ATM machine. All of which are very nice, but we could have gotten along just fine without them.

Then there are those inventions that have had huge, far-reaching impacts on civilization. The plow allowed us to cultivate crops. The printing press advanced literacy and the exchange of ideas. The automobile, the airplane and the telephone, for example, have effectively altered relative concepts of time and space. Refrigeration has dramatically improved health by reducing spoilage of food. Similarly, antibiotics, indoor plumbing, the steam engine, the cotton gin, gunpowder, the electrical grid, the microchip, the sewing machine, the telephone, the computer and the clock have all had powerful and complex impacts that have left the world a vastly different, and often better, place.

So what's coming next?

Interestingly, all great inventions are defined by one or more of the following characteristics: They improve living conditions, they disseminate culture, they allow us to get what we want, by force if necessary, and they have the potential to cause great social or economic upheaval.

When compiling a list of the ten things that will change the way we live, we first went about ruling out what we were not going to include. For example, there are a number of different drugs and medical technologies currently under development--such as wrapping engineered RNA in nanomaterials and feeding them into the bloodstream, which is now being developed at CalTech--that hold great promise for humanity--if they can in fact work. The problem, of course, is that many promising cures fail in the trial phase and never come to market.

And tempted as we were, we also forced ourselves to exclude some of the more fantastic gadgets that are more likely to appear in a sci-fi movie than at a retail outlet. Do we want to see jetpacks and teleporters in our lifetime? You bet we do. Do we think we will? Well, let's put it like this: We aren't holding our breath.

What we are interested in are the things that may not yet be in widespread use but are coming up fast. These are inventions and technologies that are already proven, and that no FDA will reject or send back for more testing. Things that are not only cool but are also technologically and economically feasible. Developments that will not collapse because the stock market fizzles or that will never get beyond a clever PowerPoint presentation.

The drawback, if there is one, is that many of these things aren't that new or exciting. That's because many of them are either happening right now or just beginning to take off. After all, Gutenberg was only able to print a handful of Bibles in his lifetime, while today more than one million titles are published every year, or approximately one book every 30 seconds.

Take [voice-over-Internet-Protocol](#), or VoIP, as it is usually called. This technology essentially lets people make telephone calls over the computer. What's so great about this is that it will allow people to make free, or extremely cheap, phone calls. This technology really works--and is getting better all the time. Not surprisingly, it also scares the bejabbers out of the phone companies, who are terrified that their business model will become as outmoded as Western Union.

Another new technology is [fuel cells](#), which could eventually alleviate the world's dependence on polluting and increasingly expensive fossil fuels--not to mention extend the life of cell-phone batteries, laptops and power generators.

The problem with most of these technologies is not that they don't work. In some cases, it is more a question of replacing existing technologies and attitudes that, out of ignorance or self-interest, resist adapting. For example, the telephone companies' scramble to adjust to life after VoIP.

The other obstacle is that many of these new things are still too experimental or too expensive to be commercially implemented. Last year in California, Honda Motor introduced the FCX, a prototype fuel-cell car that costs around \$500 per month to refuel and had an estimated cost of \$1 million. It will be years before economies of scale make such a car financially viable for both the manufacturers and consumers. But at least they are trying.



Fuel Cells

In fuel cells, the energy of a reaction between a fuel, such as liquid hydrogen, and an oxidant, such as liquid oxygen, is converted into electrical energy. Fuel cells will change the global economy, and not just because they will be as big a development in motoring as the internal-combustion engine was. They will also be used as cell-phone batteries and power generators, among other things. And they will eliminate the problem of what to do with used batteries: Theoretically, fuel cells are renewable forever.



Gene Therapy

Although the FDA has not approved any human gene therapy for sale, the potential for using it to correct defective genes responsible for disease development is enormous. Gene therapy works by inserting genes into cell tissue, essentially replacing a defective gene with one that works. So far, researchers have been exploring how gene therapy could be used to combat or eradicate diseases caused by single-gene defects, such as cystic fibrosis, hemophilia, muscular dystrophy and sickle cell anemia. With time, however, it is hoped that it

will not only revolutionize the treatment of all disease but will also be able to prevent hereditary diseases, such as Down syndrome and heart disease.



Haptics

Whether people know it or not, haptics has been subtly making inroads into everyday life in the form of vibrating phones, gaming controllers and force-feedback control knobs in cars (**BMW's** iDrive system uses the technology). But the science of haptics has the potential to do much more. Products, such as the CyberForce "whole-hand force feedback system" from Immersion Corporation and SenseAble Technologies, let users interact physically with virtual objects. For instance, by using a sensor-equipped

glove and a force-reflecting exoskeleton, you could literally feel the shape, texture and weight of an onscreen 3-D object. Such devices are used now for virtual modeling, medicine and the military, but as costs decrease, haptic interfaces could become valuable communication tools. Using haptics technology, people will be able to shake hands virtually over the Internet, and doctors will have the ability to remotely diagnose and operate on patients.



Internet2

Internet2, orUCAID (University Corporation for Advanced Internet Development), is the next-generation Internet. It is a nonprofit consortium developed in 1996 by 208 leading research universities in the U.S., as well as by such companies as Qwest, Cisco, Juniper and Nortel, to deliver video and data at much faster speeds than are possible over the public Internet. The reason is that it has developed and deployed the Abilene national backbone network, which operates at a capacity of 10 gigabits per second through the use of optical-networking technologies. It also provides its

more than 5 million connected desktops with speeds of at least 100 megabits per second--100 to 1,000 times faster than the speed of typical home broadband modems. This will allow for faster downloads of more complex packets of data and facilitate such activities as peer-to-peer applications, high-definition videoconferencing and, yes, gaming.



LifeStraw

What's the most precious liquid on earth? If you said oil, you're wrong. It's water. Even though more than 70% of the earth's surface is covered in H₂O, many parts of the world suffer from a persistent and crippling shortage of potable drinking water. LifeStraw hopes to change all that. The 10-inch-long, 1-inch-in-diameter device is made by Vestergaard Frandsen S.A. of Lausanne, Switzerland, out of a patented resin that kills bacteria on contact. Its filters remove bacteria, such as salmonella and staphylococcus, from surface water in rivers and

lakes. Reusable and, at \$3 to \$4 each, affordable, it has the potential to not only reduce the outbreak of disease but also to improve living standards and sanitation in many of the world's poorest regions.



MRAM

MRAM, or Magnetoresistive Random Access Memory, could change the way we work. Researchers at IBM have shown that MRAM can be six times faster than the current industry-standard memory, dynamic RAM (DRAM). It is almost as fast as static RAM (SRAM) and is much faster and suffers less degradation over time than Flash memory. Unlike these technologies, MRAM uses magnetism instead of electrical charges to store data. As a result, it is lower in density and in cost. In December 2005, Sony engineers verified operation

of a spin-torque-transfer MRAM in the lab with data-write speeds of two nanoseconds. If adopted as a universal standard, MRAM could have significant military communications applications.



\$100 Laptop

If we are to accept that the world economy is now fully dependent upon the information economy, then it stands to reason that those people who are left out of the global information network are doomed to an endless cycle of poverty. The Massachusetts Institute of Technology Media Lab has designed a fully functional laptop computer that can be sold for \$100, so that children in poor or developing nations can get access to the Internet. To keep costs down, the laptop will use a \$35 dual-mode display (the kind found on cheap DVD players), a 500-megahertz

processor, a slimmed-down operating system and will have only one gigabyte of storage. Users will be able to plug it into a wall outlet or charge it by a crank-driven battery, and it will connect to the Internet via a wireless card. To be sure, these laptops are not going to be playing Quake 4 anytime soon, but they could give disadvantaged kids a shot at taking part in the digital community. MIT hopes to have a working prototype by November 2005 and production units shipping to government education ministries by the end of 2006.

\$200 Barrel Of Oil



It's not an invention, but it will have a dramatic effect on the way everyone lives. Although the predictions range from terrifying to calming, all experts agree that a dramatic rise in the cost of fossil fuel would have a devastating impact not only on the global economy but on global society as well.



VoIP

Voice-over-Internet Protocol lets people make telephone calls over the Internet or any other IP-based network. Because the voice data flows over a general-purpose packet-switched network, instead of dedicated, circuit-switched voice transmission lines, the cost of making telephone calls for both business and residential users is much less than with traditional telcos. The reason it is so cheap is that the high-speed Internet providers essentially bundle VoIP free with Internet access. Another advantage is that it is mobile: All one needs is an Internet

connection to make a phone call from anywhere. But there are a few drawbacks--although these are being smoothed over--such as quality and reliability.



WiMAX

WiMAX stands for Worldwide Interoperability for Microwave Access, which is a long-range, standard-based wireless technology that will effectively allow people to access their phones, computers and the Internet from virtually anywhere. No more need to wait for the cable or phone company to install the "last mile" of pipe to your home. The IEEE 802.16 broadband wireless access standard provides up to 31 miles of linear service area range and allows for connectivity between users without a direct line of sight. This is significant for several reasons: First, it

will increase the ease and frequency with which people make wireless connections for work or leisure; second, it will have enormous potential applications in underdeveloped countries--as well as rural areas of the First World--which lack adequate communications infrastructure; and third, no more messy wires.

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