

# TECH-tastic

## Technology's Impact on Business

So What

As a student, the way you live and study is much different from students of the past—even the not-so-distant past. You might like listening to music on your iPhone as you go over your review questions—10 years ago, even the original iPhone hadn't quite made it to the market yet. For your research paper, you might jump online to find the latest economic statistics on Peru—25 or 30 years ago, you'd have to head to the library or crack open a leather-bound encyclopedia to find these stats.

As you can see, technology has drastically changed the way we go about our daily tasks. The impact of technology on how we work and conduct business is just as significant. Follow along as we explore some of the technologies that modern businesses use, as well as the ways that technological innovation has altered and influenced the business world.

## A Whole New World



What do you think of when you hear the word “technology”? Do you picture state-of-the-art computers, talking robots, driverless cars, etc.? These inventions are definitely technological achievements. But technology doesn't just refer to the new and improved electronic devices we enjoy today. A good definition of **technology** is “the practical application of science to society and industry.” This means that many innovations throughout history are considered technological accomplishments. Consider the following:

- The wheel
- The steam engine
- The plow
- The automobile
- The clock
- The airplane

None of these items may seem particularly exciting to you now. But, at the time they were introduced to business and society, they were thrilling new inventions! They changed the way people went about their lives and work. Can you think of even more technological innovations that have changed civilization throughout history?

### Objectives

- A** Describe the types of technology used by businesses.
- B** Explain the ways business has changed due to technology.



James Fallows explores “The 50 Greatest Breakthroughs Since the Wheel” in a piece for *The Atlantic*. You can read it at <http://www.theatlantic.com/magazine/archive/2013/11/innovations-list/309536/>.

## Modern technology

Let's take a closer look at some of the technologies that are influencing businesses today.

**The Internet.** The Internet is arguably the most transformative technological innovation of all time. It has certainly had an enormous impact on the way we live and the way businesses think and operate. Through the Internet, businesses both big and small can quickly and easily connect to customers and potential customers across the globe. Not only can businesses reach customers online, they also enjoy faster and improved internal communications, research abilities, and connections with suppliers. Think about how the Internet affects your own life—how it helps you to communicate with friends and family, to get your schoolwork done faster, to get your holiday shopping accomplished more easily, etc. You probably don't go a single day without getting online in some way, shape, or form. This technology is just as significant in the daily life of a business.

A specific Internet technology that can affect businesses is known as **Internet telephony**. This refers to communications that take place online rather than over traditional public networks. The most common of these technologies is **Voice over Internet Protocol**, or VoIP. This type of technology connects people quickly, either by voice or by voice and picture combined (think Vonage or Skype). The use of Internet telephony gives businesses greater flexibility with communication and can cut down on costs.

**Computer technology.** Did you know that when computers were first invented, one computer took up the space of an entire room? And it probably had less computing power than your current cell phone. Today, desktop and laptop computers are common. Over 80 percent of American households have at least one computer. (For an interesting visual timeline of computer technology history, visit <http://www.computerhistory.org/timeline/computers/>).

Computer technology encompasses much more than just PCs and Macs. It also includes:

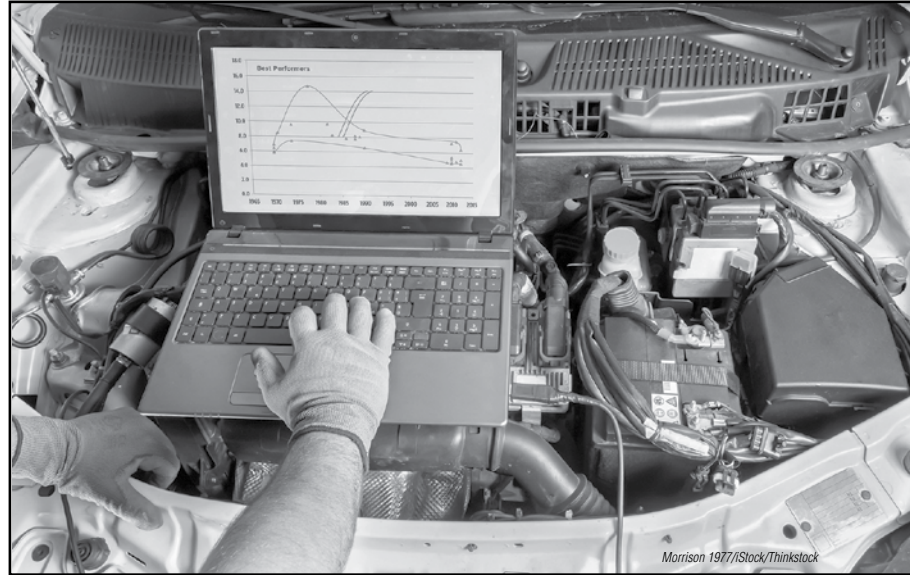
- **Hardware**—**Hardware** refers to the physical components of a computer. It includes all the mechanical and electronic “stuff” that makes a computer run. Computer hardware technology is constantly improving. Remember the early computers that were the size of your living room? Now, a tiny microchip inside a computer's processor can store billions of bits of data.

- **Software**—**Software** refers to programs that tell your computer what to do. If you download a video game onto your laptop, that's software. If you install a program that helps you edit photos, that's software as well. Businesses use all kinds of software to make their operations smoother and more efficient. There's accounting software, inventory-control software, and customer relationship management software—to name just a few examples! New software programs that help with both personal and business tasks are introduced all the time.



- ▲ Video conferencing allows businesses to collaborate across the country and globe in ways they never could before.

- Expert systems—**Expert systems** are a special kind of computer software designed to mimic the knowledge of a human expert. For example, automotive mechanics often use expert systems to diagnose trouble in a car's engine. This allows them to fix the problem more quickly.
- Databases—Modern computers can store astounding amounts of data. Being able to use **databases** (both online and offline) is a great advantage for businesses. Customer records that used to take up row upon row of filing cabinets are now kept on computers for quick and easy access, organization, and editing.
- Networking abilities—Businesses can host their own computer networks, keeping all their employees and information connected at all times. And these **networks** can be virtual. This means that an employee can connect to the network from home—or from anywhere in the world.
- Electronic transfer of funds—Computer-based systems allow businesses to transfer money quickly and easily. Have you ever used an ATM? All it takes is an ATM card and a **PIN** (personal identification number) and, within seconds, you can draw cash out of your bank account or transfer money from checking to savings. Businesses can use this same technology, only on a much larger scale, to manage their funds.



▲ What other industries do you think could benefit from expert systems?



▲ Militaries use virtual training to train personnel for dangerous situations.

- Virtual training—Computers can be used for training employees in certain fields. Pilots and astronauts, for instance, spend hours in flight simulators before taking off in a real airplane or space shuttle. Using virtual training not only makes the process safer, it makes it much more cost-efficient as well. Virtual training is used by all kinds of professionals, including dentists, firefighters, and even hairstylists!

- Computer automation—Computer automation has drastically changed many industries, especially the manufacturing industry. **Computer-aided design (CAD)** helps companies to plan and test products more efficiently, and **computer-aided manufacturing (CAM)** helps them to produce those products in more cost-effective ways. In computer-aided manufacturing, computers direct robots or other machines to do the work. These tools are usually directed by skilled employees who are trained in their use.

**Satellite technology.** **Satellite** technology has come a long way, and it's still evolving. Think of all the ways satellite technology affects your life—satellite radio, satellite television, **GPS** (global positioning systems), etc. Businesses rely on satellite technology, too. A business might use satellite technology to conduct video conferences across the globe or to receive relevant daily broadcasts, such as Bloomberg Television, a financial network that provides stock quotes in real time.

**Cell phones and other mobile devices.** You probably don't remember a world without cell phones. Today, over five billion people living all over the world have them. Not only do cell phones allow us to call anyone at any time, they also connect us to the Internet, store our music, give us the ability to send text messages, and, of course, let us play games. There's even a **smartphone** application that sends out a signal to keep mosquitoes away!

Businesses rely on cell phones for many of the same reasons that you do. Employees need to reach each other quickly and easily. They need to be able to access their emails, check their schedules, and get directions to their clients' offices. Cell phones help them to accomplish these tasks and much more. (For more examples of the impact of smartphones on the business world, check out Marissa Anwar's blog post "Five Ways That Smartphones Have Changed Businesses" at <http://thirtysixmonths.com/5-ways-that-smartphones-have-changed-businesses/>.)

**Improved materials and methods.** Remember, technology is not all about computers and electronics. There are many other ways in which science has been applied to industry to create change and progress. Over the years, many materials used to create products have been improved—plastics, textiles, fuels, engine components, and chemicals used in pharmaceuticals, to name just a few. In addition to better materials, improved methods of manufacturing have also evolved due to technological innovation. Machinery is now faster and more efficient. There are new and better methods of making glass, paper, steel, etc. The result is that businesses are able to create products in the most efficient and cost-effective ways possible.



▲ Next time you use the GPS on your phone, think about the satellite technology that makes it possible!

## Summary

Technology is the practical application of science to society and industry. Some of the most important technologies affecting modern businesses are the Internet, computer technology, satellite technology, cell phones (and other mobile devices), and improved materials for and methods of manufacturing.

## TOTAL RECALL

1. What is technology?
2. Describe the following technologies used by modern businesses:
  - a. The Internet
  - b. Computer technology
  - c. Satellite technology
  - d. Cell phones and other mobile devices
  - e. Improved materials and methods

# THE GRAY ZONE

The Internet has certainly provided many great advantages for businesses. However, it can also provide many great distractions for employees! Businesses often complain that the availability of personal email, social networking sites such as Facebook, and instant messaging drives productivity down. Many businesses even block certain sites and apps on company computers. Although it is perfectly legal for companies to take this action, many employees complain that blocking the sites negatively affects morale. They claim that employees should be trusted to use the sites wisely at work and not to waste time on them. Some of the sites even provide networking opportunities that might help them do their jobs better. What do you think? Is it ethical for companies to block certain websites? Is it ethical for employees to use these sites at work?

## Winds of Change



There's no doubt that technology has changed the way businesses operate. Let's take a look at some of the specific effects technological innovation has had on modern businesses.

***New industries have begun.*** Sometimes, a new technology can spawn an entirely new industry. Examples include the aviation industry, the computer industry, and the robotics industry. These industries did not exist before the appropriate technology came along to create and support them. Can you think of even more industries that have been created by technological innovation?

***Existing industries and jobs have been altered or eliminated.*** While technology and progress are usually considered to be good things, they can often threaten existing industries or jobs. Many employees, especially in the manufacturing industry, have found themselves out of work when a computer technology comes along that can streamline their tasks for the company—and, keep in mind, computers don't earn salaries. Other times, technology simply aids or alters the way employees go about their work. Accountants used to rely on calculators or adding machines to complete their job duties. Now, they can choose from a variety of accounting software programs. (For more examples, check out Douglas Karr's article "Five Industries Radically Transformed by the Internet" at <https://www.marketingtechblog.com/industries-changed-by-the-internet/>.)



▲ The balance between technology and human employees is constantly shifting.

Sometimes, entire industries are placed in jeopardy due to technological advances. People used to count on travel agencies when making their vacation plans. Now, you can book an entire trip online—flight, rental car, hotel, even activities—using a travel website such as Expedia or Orbitz. These “virtual travel agents” have drastically cut down on the demand for physical travel-agency offices staffed by real, live employees. Can you think of even more industries that have been significantly altered or threatened by technology?

**Other industries have been stimulated.** New technologies can stimulate industries related to the innovation. For example, the rise in the manufacture of airplanes and automobiles created growth in the related industries of glass, rubber, steel, etc.—all materials used to produce planes and cars. This phenomenon is logical, but did you know that technological innovation can also stimulate growth in *unrelated* industries? Think about it. Thanks to the introduction of such time-saving technologies as dishwashers, microwaves, and washing machines, we spend a lot less time at home and have more free time (and money) to do things like travel, participate in recreational sports, and pursue leisure activities.



▲ Amazon’s fast delivery already surpasses its competitors, but its future plans to use drone technology would have a monumental impact on delivery service.

**The nature of competition has changed.** Businesses are always competing with each other for scarce customer dollars. Technology has changed the nature of that competition. First of all, businesses *must* stay on top of new technologies to remain competitive. A freelance graphic designer who hasn’t learned to use the latest software is at a disadvantage for getting jobs, compared to other designers. In some industries, such as the computer industry, it’s not enough for businesses to just familiarize themselves with the latest technologies—they must lead the way in *creating* new technologies to stay competitive.

**The nature of marketing has changed.** Technological innovations have created new and improved methods of communication and information gathering, both of which greatly affect a business’s marketing efforts. Internet marketing is now an industry all its own. The way a customer or potential customer interacts with a business online provides a wealth of information the business can use to refine and target its marketing campaigns. Can you think of even more ways in which technology has changed the nature of marketing?



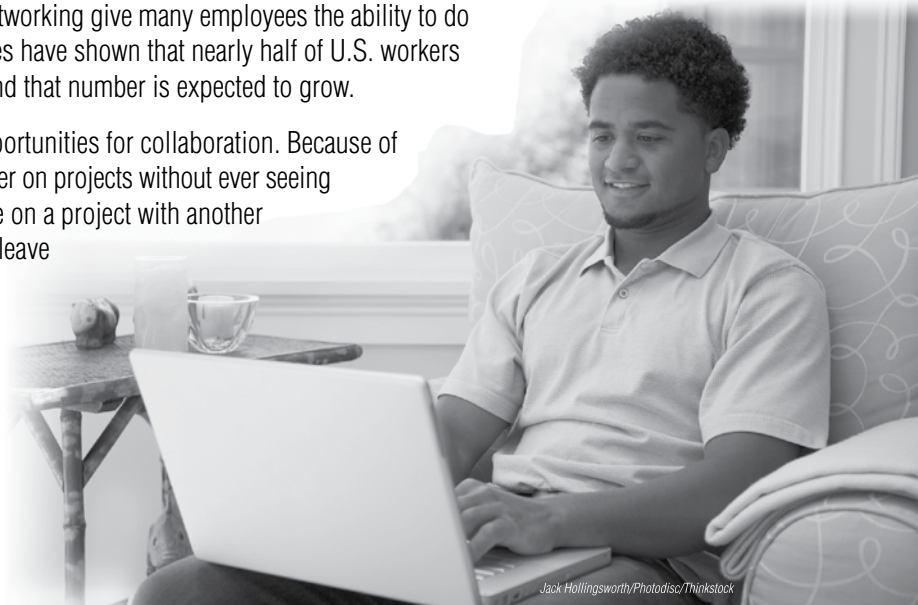
Larry Alton dives into the topic of technology’s effect on marketing in “How Technology Is Changing Marketing and Why We Need to Keep Up.” You can read it at <http://www.smartinsights.com/manage-digital-transformation/digital-transformation-strategy/how-technology-is-changing-marketing-and-why-we-need-to-keep-up-2/>.

**Jobs have changed.** Both the job market and the nature of jobs themselves have been transformed due to technology. In the same way that businesses must stay on top of new technologies, individual employees must update their skills constantly to stay relevant and to compete for positions in which the need for technical knowledge is increasing all the time.

The nature of work has also changed due to the increase in **telecommuting** (working from home or a remote location) opportunities. The Internet and remote networking give many employees the ability to do their jobs without ever stepping foot into the office. Studies have shown that nearly half of U.S. workers have the ability to telecommute at least part of the time, and that number is expected to grow.

Technology also allows employees to enjoy enhanced opportunities for collaboration. Because of email, video conferencing, etc., employees can work together on projects without ever seeing each other in person. An engineer in Iowa may collaborate on a project with another engineer in Spain without either employee ever having to leave his/her own office.

**Entering new and foreign markets is easier.** It used to be only large companies that had the resources to sell products or set up operations in new or overseas markets. Now, even a small, one-person operation can do so. Let's say you make custom jewelry and sell it online through a site such as Etsy. This technology allows you to sell your products to anyone, anywhere in the world, if you choose to. Of course, shipping will be cheaper and easier if you are sending products to Indiana rather than to India, but the ways in which technology has improved transportation make it possible.



▲ Imagine working at your dream job—from the comfort of your own home! Thanks to technology, it's possible!

**Productivity is higher, and costs are lower.** As you know, if a business takes advantage of available technology, it can operate at the highest possible productivity level and incur the lowest costs. This is the result of materials, tools, and operating systems that are constantly improving because of technological advances. It's just another reason why it's important for businesses to keep pace with technology if they want to remain competitive.



▲ When you spend time with your friends, how often do you put down your devices and communicate without technology? It might be harder than you think!

**Businesses have been forced to address certain problems technology has caused.** The results of technology growth are not always positive for everyone. Certain social problems, such as kids' addiction to video games and a general decrease in face-to-face interaction, are often blamed on technology. Some technologies are also held responsible for certain environmental issues, including air pollution and the hazards of getting rid of outdated electronic equipment. For public relations purposes, many businesses that use or create these technologies attempt to address some of these problems. Automobile manufacturers, for instance, attempt to create better cars that emit fewer chemicals and pollution into the air.



Not only can technology cause social and environmental problems, it can affect our physical and emotional health as well. Lindsay Holmes explores “Sneaky Ways Technology Is Messing With Your Body and Mind” in this article for *The Huffington Post*. [http://www.huffingtonpost.com/2014/12/05/health-effects-of-technology\\_n\\_6263120.html](http://www.huffingtonpost.com/2014/12/05/health-effects-of-technology_n_6263120.html). How do you think businesses might be able to address some of the issues among employees?

## Information age

It's worth repeating that technological innovation has made information gathering a much easier and faster task for businesses. This aids in decision making. Let's say a company is considering entering a new market or launching a new product. The Internet makes it easy to gather information on the new market or to check out what competitors are doing, without necessarily committing to months of independent research. The information may be free, or it may be available for purchase through a trade association or research firm.

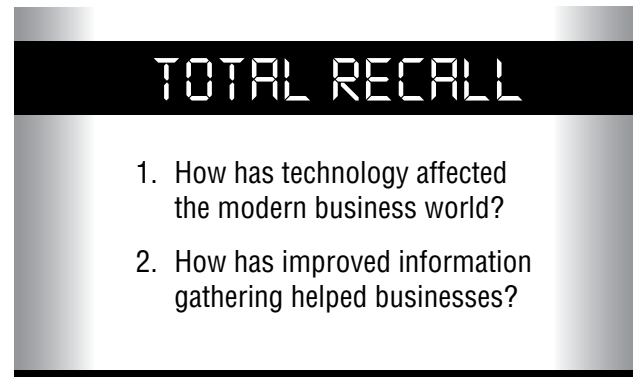
Technology also allows businesses greater opportunities to gather information about current and prospective customers. Customers provide information when they register on a company's website or download its app, request product information, sign up for email newsletters, and enter warranty data. In short, it's much easier for businesses to interact with customers than it used to be. If businesses use this ability wisely, it gives their marketing and customer-relations efforts greater chances of success.



- ▲ What kind of information could businesses get from email newsletter subscribers that could help them find success?

## Summary

Technology has affected business in the following ways: new industries have begun; existing industries and jobs have been altered or eliminated; other industries have been stimulated; the nature of competition has changed; the nature of marketing has changed; jobs have changed; entering new and foreign markets is easier; productivity is higher, and costs are lower; and businesses have been forced to address certain problems technology has caused. Faster and easier methods of information gathering aid businesses with decision making and interacting with customers.



# Make It Pay!

**W**hat technologies do you use regularly at your place of employment?

How have these technologies affected the business as well as your individual job?

If you are not working right now, think about the technologies you use on a daily basis.

How do local businesses use these same technologies?