6

Work

6.1 Changes, Fears, and Questions

Computers free us from the repetitious, boring aspects of jobs so that we can spend more time being creative and doing the tasks that require human intelligence. Computer systems and the Internet provide quick, reliable access to information so that we work smarter and more efficiently. But people still do the work. Nurses care for the elderly, and construction workers build buildings. Architects use computer-aided design systems, but they still design buildings. Accountants use spreadsheets and thus have more time for thinking, planning, and analysis. But will computers design buildings? Will audits be automated?

The introduction of computers into the workplace generated many fears. Many social critics, social scientists, politicians, unions, and activists saw virtually all potential effects of computers on work as highly threatening. They foresaw mass unemployment due to increased efficiency. (Some argued, at first, that money spent on computers was a waste because computers *decreased* efficiency.) They argued that requiring workers to acquire computer skills was too heavy a burden, and that the need for increased technical training and skills would widen the earning gap between those who obtain the new skills and those who do not. They saw telecommuting as bad for workers and society. They expected offshoring (hiring people or companies in other countries to perform services that workers in one's home country used to do) to eliminate a huge number of jobs.

Although the dire predictions were wrong, the many and widespread rapid changes raise significant social questions. How do we deal with the dislocations and retraining needs that result when computing technology and the Internet eliminate jobs? "Telecommuting" has become part of our vocabulary, describing the phenomenon of working at a distance from the traditional company office or factory, connected in cyberspace. What are its advantages and disadvantages? How does it affect the physical distribution of population and businesses? Employees have powerful smartphones, tablets, and other devices that can make their work easier. Should they use their own devices for work? What risks need to be considered?

At the same time that information technology gives some workers more autonomy, it gives employers increased power to monitor the work, communications, movements, and online activity of employees and to observe what their employees do away from work (e.g., in social media). These changes affect productivity, privacy, and morale. Why do employers monitor employees? Should monitoring be limited?

In this chapter, we explore these questions.

6.2 Impacts on Employment

> *But nowhere is there any mention of the truth about the information highway, which is mass unemployment.*
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> —David Noble, "The Truth About the Information Highway"[1]

6.2.1 Job Destruction and Creation

The fear that computing technology and the Internet would cause mass unemployment might seem absurd now. Yet, since the beginning of the Industrial Revolution, technology has generated fears of mass unemployment. In the early 1800s, the Luddites (of whom we say more in Chapter 7) burned weaving looms because they feared the looms would eliminate their jobs. A few decades later, a mob of seamstresses and tailors destroyed sewing machines because of the same fears.[2]

More recently, in the 1950s and 1960s, factory automation came under (verbal) fire from presidential candidate John F. Kennedy and industry and labor groups for threatening to bring the menace of increased unemployment and poverty. The quotation at the beginning of this section is about the information highway (a term commonly used for the Internet in the 1990s), but social scientists argued that it applied as well to all computer technology. Technology critics such as Jeremy Rifkin consider the reduction in the human labor and time required to produce goods and services to be one of the horrific consequences of computers and automation. In 2011, President Obama suggested that the high unemployment rate at the time was related to people using ATMs instead of bank tellers and airport check-in kiosks instead of live agents.[3]

Perhaps such viewpoints appeared to be right in the first few decades of computer use. As the use of ATMs grew, the number of bank tellers dropped by about 37% between 1983 and 1993. The number of telephone switchboard operators dropped from 421,000 in 1970 to 164,000 in 1996. The jobs of building, selling, and repairing typewriters have disappeared. Engineers used slide rules since the 17th century. Electronic calculators made them obsolete; the jobs of manufacturing and selling them evaporated. Railroads computerized their dispatch operations and eliminated hundreds of employees. The loss of jobs continued with the development of the Web and other electronic technologies. Travel agencies closed as consumers made airplane reservations online. The jobs of 35,000 electric meter readers disappeared as utility companies installed devices that send meter readings to company computers. Similar technology monitors vending machines and oil wells, reducing the number of people needed to check on them in person. Shopping on the Internet and self-service checkout systems in stores reduced the need for sales clerks. Hundreds of music stores closed and jobs in the printing industry declined as music,

magazines, newspapers, and books went digital. Digital cameras put film processors out of work; Kodak, founded in 1880, laid off thousands of employees and filed for bankruptcy protection in 2012. As use of cellphones increased, the number of employees in the wired telecommunications industry dropped by more than 120,000.[4]

There is no doubt that technology in general and computing technology in particular eliminate jobs. Human labor is a resource. By making tasks more efficient, computers reduce the number of workers required to carry out the tasks. The goals of technology include a reduction in the resources needed to accomplish a result and an increase in productivity and standard of living. If we look back at our examples of lost jobs, we see that many of them accompanied increased productivity. While the number of telephone operators was dropping by more than 60% between 1970 and 1996, the number of long-distance calls increased from 9.8 billion to 94.9 billion.* Manufacturing productivity in the United States more than doubled between 1980 and 2002.[5] Productivity growth fluctuates, but the trend is upward.

A successful technology eliminates some jobs, but creates others. With a sewing machine, a seamstress could make more than two shirts a day. Rather than loss of jobs, the sewing machine meant a reduction in the price of clothes, more demand, and ultimately hundreds of thousands of new jobs.[6†] It is obvious now that computers created new products and services, whole new industries, and millions of jobs. From the electronic calculators that replaced slide rules to the networks and cellphones that replaced telephone operators to the social networking services that created a new phenomenon, the new devices and services all represent new jobs. The World Wide Web contributed to the creation of about 100,000 new Internet-related jobs in 1996. By 1997, more than 109,000 people worked in the cellular communications industry in the United States. By 1998, the Semiconductor Industry Association reported that chip makers employed 242,000 workers, directly, in the United States and 1.3 million workers indirectly. The chip industry, which did not exist before the microprocessor was invented in the 1970s, ranked fourth among U.S. industries by annual revenue. Although e-commerce and automatic checkout in stores reduces demand for sales clerks, that does not mean there are fewer people in these jobs. Employment increased 3% in the retail sector between 2003 and 2006, while employment overall increased 6%, according to the Economic Policy Institute. Contrary to predictions in the early 1990s, the number of bank tellers climbed to new highs in 2008, and the Bureau of Labor Statistics (BLS) forecast continued increases through 2018.[7]

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* In the 1940s, human operators, plugging wires into boards, did almost all the routing and switching of telephone calls. The volume of telephone calls in the United States has increased so much that, if this work were done manually instead of electronically, it would require more than half the adult population of the country as telephone operators.[8]

† Sewing machines were first marketed to factory owners, just as computers were first used by large companies. Isaac Singer had the insight to sell them directly to women, in a parallel to the eventual shift from corporation-owned mainframes to personal computers for consumers.

Countless new products and services based on computer technology create jobs: iPods, medical devices, 3-D printers, navigation systems, smartphones and apps for them, and so on and on. The Facebook app industry alone accounted for between 180,000 and 235,000 fulltime jobs in the United States in 2011. New technologies and products create jobs in design, marketing, manufacture, sales, customer service, repair, and maintenance. New technical jobs also create jobs for such support staff as receptionists, janitors, and stock clerks. The enormous growth of retail sales on the Web contributed to an increase in jobs in the package shipping industry. U.S. consumers spend billions of dollars for personal computer software each year and billions more on online services (such as online tax preparation). Computer and Internet technology generated all the jobs at Google, Apple, eBay, Hulu, Amazon, Microsoft, Twitter, Zappos—and thousands more companies. Forrester Research estimated that governments and businesses worldwide spent $1.6 trillion on information technology. That money paid for a very large number of jobs.[9]

A harpist described how a series of technologies eliminated the jobs of musicians:[10] Piano rolls, automated player pianos, and recordings replaced the live piano player at silent movies. Juke boxes replaced live bands in bars. Records and then digital music replaced live orchestras and bands at Broadway shows, dance performances, and weddings. There is another way to look at the same changes. A few hundred years ago, listening to professional-quality music was a rare luxury for most people. Only the wealthy could hire professional musicians to perform for them. Technology, including electricity, radio, CDs, DVDs, iPods, smartphones, data-compression algorithms, and the Web brought the cost of an individual "performance" in a private home (or out on a hiking trail) down so low that music is available to almost anyone. The effect on employment? Tens of thousands of musicians make a living, and some make a fortune, in jazz, country, classical, zydeco, new age, rock, and rap music. In the long term, if technology brings the cost of a product or service down far enough to expand the market, more people will work in that field, be it music or package delivery.

Some of the same technologies that eliminate jobs help people get new ones. In the past, job seekers did research on jobs and companies in libraries and by telephone. The Web and social media make more information and services available to a job seeker with much more convenience and for a lower price. We post résumés on job sites. We learn about job openings from tweets. We learn about a company's reputation among its employees on a variety of forums. We can learn about climate, schools, entertainment, and religious facilities in distant towns before spending time and money to travel for an interview. We can interview at distant companies without traveling: some conduct job interviews at online virtual communities. Companies recruit via social media and specially designed online games. Online training programs help people learn new skills.

Airplanes, automobiles, radio, television, computers, much medical technology, and so on, did not exist before the 20th century. The use of telephones and electricity was

minimal. Throughout the 20th century, there was an enormous increase in technology and a decrease in jobs in such areas as agriculture and saddle making. If technology's overall impact was to destroy jobs, there should have been fewer people working in 2000 than in 1900. But, with a population that approximately quadrupled between 1900 and 2000, the U.S. unemployment rate was 4% in 2000, lower than throughout most of the century. (One segment of the population is working less: children. In 1870, the average age for starting work was 13; by 1990, it was 19. In the early 20th century, children worked long days on farms and in factories and mines. Technology eliminated many of the jobs they did.)

Many new jobs created by computer technology are ones not imagined or possible before. They range from jobs of great social value (e.g., making life-saving and life-enhancing devices) to entertainment and sports (e.g., computer game designers, professional computer game players, and video game coaches). Fifteen years ago, who would have thought that people would buy (and hence others would produce, market, and sell) ringtones for their phones? Who would have imagined that there would be tens of thousands of job openings for smartphone software experts?

What is the overall effect of computerization on employment rates? Does it create more jobs than it destroys? Measuring the effects of computers alone is difficult, because other factors influence employment trends, but we can look at some overall numbers. In the United States, in the ten years between 1993 and 2002 (a decade of increasing computer and Web use), 309.9 million jobs ended—a huge number to anyone who has not seen these figures before. But 327.7 million jobs were added in the same period, for a net increase of 17.8 million jobs. This "job churn," roughly 30 million jobs opening and closing each year,* is typical of a flexible economy. In stagnant economies, people do not change jobs often.[11]

Consider the times of significant unemployment in the United States in the last century. Technology did not cause the Great Depression in the 1930s. Economists and historians attribute the depression to a variety of factors including "business cycles," the then-new Federal Reserve Bank's inept manipulation of interest rates, and that old standby, "greed." Unemployment was high in the early 1980s and in the early 1990s. But growth in use of computers has been dramatic and continuous, especially since the mid-1970s, when personal computers began to appear. Mortgage policies (of financial institutions and the government) were a major cause of the recession that began in 2007; technology was not the cause.

The Organisation for Economic Co-operation and Development (OECD), an international organization whose members include most of Western Europe, North America, Japan, Australia, and New Zealand, studied employment trends in 25 countries. OECD concluded that unemployment stems from "policies . . . [that] have made economies rigid, and stalled the ability . . . to adapt."[12] The study suggested that "unemployment

* Roughly half are seasonal jobs that appear and disappear each year.

should be addressed not by seeking to slow the pace of change, but rather by restoring economies' and societies' capacity to adapt to it." Unemployment in many European countries is often higher than in the United States. But Europe is not more technologically advanced or computerized than the United States. The differences have more to do with differences in flexibility in the economies and other political, social, and economic factors. The OECD report says that "history has shown that when technological progress accelerates, so do growth, living standards, and employment."[13]

We saw that new technology reduces employment in specific areas and in the short term, but it is obvious that computer technology did not and does not cause mass unemployment. Those who continually predict mass unemployment see only the old, preexisting jobs that are lost. They lack the imagination or the knowledge of history and economics to see that people create new jobs. The next big breakthrough in technology, perhaps a major advance in artificial intelligence (AI) or robotics, will generate the same scary projections.

Long-term net social gains from new jobs are not of much interest to a person who is fired. The loss of a job is immediate and personal and can be devastating to the individual and his or her family. When large numbers of people lose their jobs in one small community or within a short time, difficult social problems occur. Thus, there is a need for people (individual workers, employers, and communities) and institutions (e.g., schools) to be flexible and to plan for change. There are roles for education professionals who do long-range planning, for entrepreneurs and nonprofit organizations that provide training programs, for large companies that can retrain their employees, for financial institutions that fund start-up companies, and so on.

> *Why not use spoons?*
>
> —The apocryphal response from a man who saw thousands of workers digging at a construction site with shovels. When he asked why they were not using modern excavation equipment, he was told that using shovels created more jobs.

But are we earning less?

Economists agree that the average hourly pay of manufacturing workers quadrupled (in constant dollars) between 1909 and the mid-1970s. They disagree about what happened after that. Wages appeared to decline as much as 10% after 1970. This is sometimes cited as an indication that the value of human work is declining as computers take over tasks people used to do. However, fringe benefits rose significantly, increasing total compensation by about 17% according to some experts, but other experts disagree. Some economists believe the apparent decline resulted from improper computation of the Consumer Price Index.[14] Two researchers, Michael Cox and Richard Alm, decided to avoid the problems of using income and inflation data and, instead, they looked at a long list of direct measures of consumption and leisure. For example, they reported that

in the last quarter of the 20th century, attendance at operas and symphonies doubled (per person), recreation spending more than tripled (per person), and spending on toys quadrupled (per child). From 1970 to 2010, the average number of televisions and automobiles per household increased, and the percentage of new homes with air conditioning rose from 49% to 88%. Cox and Alm also calculated how much time an average worker had to work to earn enough money to buy food and luxuries. The cost, in the average worker's work time, of 100 miles of air travel dropped by 40%, while the cost of a coast-to-coast phone call dropped to one-tenth the work time required in 1970. It might not be surprising that the cost of high-tech services dropped so much. The cost, in worker's time, of many basic foods also dropped. Technology is likely responsible for a large share of the reductions. In addition, comparing income and cost data misses improvements in product quality, safety, convenience, and comfort due to technology.[15]

Since the beginning of the Industrial Revolution, working hours have declined. We no longer routinely work 10–12 hour days, six days a week (unless we choose to). People can count working hours, like income data, in various ways, supporting different conclusions. Some economists report a significant decline in working hours since the 1950s. Others say working hours have not declined significantly. Many people continue to work more hours while income rises because they have higher expectations. They consider the lifestyle now possible to be essential. Another reason, according to labor economist Ronald Ehrenberg, is that aspects of the tax and compensation structure encourage employers to have regular workers work overtime rather than hire additional employees.[16] A third reason is that taxes take a larger percentage of income than they did in the past. People have to work more hours for the same take-home pay. Thus it is not clear at all that we are earning less, and if we are, the causes are more likely social, political, and economic factors rather than the impact of technology.

6.2.2 Changing Skills and Skill Levels

Some who are concerned about the impact of computers on employment acknowledge that, in the past, technology led to new jobs and products. They argue that the impact of computing technology is different and more negative. Computers differ from earlier technologies in several key ways.

Computers eliminate a much wider variety of jobs than any single new technological advance in the past. The impact of new machines or technologies tended to be concentrated in one industry or activity. Earlier automation eliminated primarily manufacturing jobs, but computers automate services, such as those of electric meter readers and secretaries, just as easily. The transition to new jobs is more difficult because of the broad impact. The pace of improvement in speed, capability, and cost for computing and communication technology is much faster than for any previous technology. The pace itself causes more job disruption as people continually face job elimination and the need to retrain.

The new jobs created by computing technology are different from the jobs eliminated. The hundreds of thousands of new computer engineering and systems analyst jobs require a college degree. The jobs of telephone operator and factory worker do not. At the same time, computers eliminate more high-skilled jobs than older technologies. Will jobs diverge into two distinct groups: high-paying jobs for a highly skilled and highly trained intellectual elite, and fewer low-paying jobs for people without computer skills and advanced education?

Although it often seems that our times and problems are new and different from what came before, similar concerns arose for other technologies. The steam engine and electricity brought enormous change in jobs, making many obsolete. When economists Claudia Goldin and Lawrence Katz researched earlier periods of rapid technological development, they found that the education system quickly adapted to train children in the necessary skills. They pointed out that a bookkeeper in 1890 had to be highly skilled, whereas a bookkeeper in 1920 was a high school graduate using an early form of an adding machine. In the 19th century, skilled workers earned increasingly more than manual laborers, but the trend reversed in the early 20th century, because more people went to high school and the new technologies of that era reduced the skill level needed for white-collar jobs. Normally, as demand increases for new skills, people acquire them. For example, in 1900, only 0.5 people out of every 1000 in the United States worked as an engineer. After the huge growth in technology during the 20th century, 7.6 out of every 1000 people were engineers.[17] Something went awry with this natural process in recent years. When unemployment was extraordinarily high in 2009–2011, many thousands of jobs went unfilled in engineering and other high-tech fields because there were insufficient qualified applicants. Colleges and graduate schools produced large numbers of trained people, but, for example, 62% of those earning doctorates in electrical engineering were foreign students, and most had to return to their countries because of immigration restrictions.[18] Why are American students not choosing computer science and engineering?

Complex interactive computer systems guide workers through steps of jobs that required extensive training before. Performance-support software and training software empower lower-skilled workers and make the training process for complex jobs cheaper, faster, and easier. Such systems, for example, guide auditors through an audit of a securities firm, help employees at financial institutions carry out transactions, and train sales people. The National Association of Securities Dealers reported that its auditors were fully competent after one year using such a system, compared to two and a half years without it. They saved more than $400,000 in annual training costs. Companies are more willing to hire people without specific skills when they can train new people quickly and use automated support systems. The benefits occur throughout a wide range of job levels. Several large companies, including Walgreens, hire previously unemployable people with mental and physical disabilities. They perform their jobs with the help of electronic gadgets and computer systems. Some of the systems are specially designed.

Some are the ordinary computer and automation tools that workers use in many workplaces.[19]

The BLS expects many jobs to be available that require little, if any, computer skill. Areas in which the BLS expects the most new jobs created through 2018 include nursing, home health aid, retail and office clerks, and food preparation and service.[20]

Do automated systems mean fewer jobs for high-skilled workers? Will human intelligence in employment be "devalued"? Software makes decisions that used to require trained, thinking human beings. Computers could take over many white-collar, professional jobs. Computer programs analyze loan applications and decide which to approve. Some programs are better than people at predicting which applicants are likely to default on their loans. Design jobs have become automated. For example, software to design the electrical layout for new housing developments can do in several minutes a job that would have taken a high-paid employee 100 hours.[21] Even computer programming is automated. Some computer programs write computer programs, reducing the need for trained programmers. Although it still requires highly trained engineers, there is a large degree of automation in the layout of computer chips. Programming tools enable nonspecialists to do certain kinds of programming, design Web pages, and so on.

The printing press put scribes out of work when writing was a skill possessed by only a small, "highly trained" elite. Recall from Chapter 1 that machines that did simple arithmetic in the 17th and 18th centuries shocked and disturbed people. People thought arithmetic required uniquely human intelligence. In the past, human imagination and desires continued to find new fields of work, both physical and mental, to replace those no longer needed. They continue to do so today. In spite of the trend to automate high-skill jobs, the BLS projects that the number of management, financial, software, and other professional jobs will increase significantly through 2018, and that computer software engineer will be one of the fastest-growing occupations.[22]

6.2.3 Telecommuting

Computer and communication technologies dramatically changed the way we work and where we work. These technologies encourage smaller businesses and more independent consultants and contractors—"information entrepreneurs," as they are sometimes called. It is easier for workers to work part time for different employers or clients, thus encouraging more information workers to become self-employed. Individuals and small businesses operate globally via the Web. Craftsmakers sell crafts, programmers sell their programming services, musicians sell music, and so on. Many of these people work from home some or all of the time. The Internet and wireless communications made it possible for people who are employees of large companies, as well, to work away from their desk and away from their company office. The Internet made it possible for companies to locate in small towns and work with dispersed consultants instead of having hundreds or thousands of employees in larger population centers. Millions of people work without "going to

work," that is, without going to their employer's (or their own) business offices. I will use the terms "telecommuting" and "telework" for several variations of such work paradigms. The most common meaning is working for an employer at a computer-equipped space in the employee's home. Some definitions include running one's own business from home using computers and telecommunications. In some jobs, such as sales and technical support, the office is mobile. Many people work on a laptop in a coffee shop, outdoors in a park, and on airplanes. In many fields, professional people no longer have to live in the same city or state as their employer. Definitions of telecommuting vary, so estimated numbers do also. One study reported that more than 33 million people in the United States telecommute at least one day per month.[23]

Telecommuting is common now, so it might be surprising that local governments and labor unions attempted to stop it in the 1980s.* The view of various unions at the time seemed to be that most computer at-home work would be data-entry work done by low-paid women in sweatshop conditions. The AFL-CIO advocated a government ban on all computer at-home work.[24] The efforts to stop computer work at home quickly turned futile. The mistaken views about who would do computer work at home and what the working conditions would be are reminders to be cautious about banning or restricting a new phenomenon before its applications and benefits, as well as problems, develop.

Benefits

Telecommuting reduces overhead for employers and, in some cases, increases productivity. Productivity studies in areas where work is easy to measure (e.g., data entry) showed productivity gains of 15%. Replacing or shrinking large downtown offices, where real estate and office rentals are expensive, can generate significant savings. Many employees report that telecommuting has made them more productive, more satisfied with their jobs, and more loyal to their employers. One survey found that a large majority of workers whose jobs could permit teleworking would prefer to do so at least once a week.[25]

Telecommuting, and telecommunications generally, make it easier to work with clients, customers, and employees in other countries: at home, one can more easily work a few hours at night that are compatible with foreign time zones. Telecommuting reduces rush-hour traffic congestion and the associated pollution, gasoline use, and stress. Telecommuting reduces expenses for commuting and for work clothes. It saves time that workers can use for exercise, sleep, or more interaction with friends and family. It provides previously unavailable work options for some elderly or disabled people for whom commuting is physically difficult and expensive. It allows work to continue after blizzards, hurricanes, or other disasters close roads or discourage travel. Roughly 58% of woman-owned businesses are home-based businesses.[26] Telecommuting, and the flexible

* For example, in the 1980s, the city of Chicago ordered a couple to stop using a computer at home to write textbooks and educational software because Chicago zoning laws restricted home work that used mechanical or electrical equipment.

hours it permits, can help reduce child-care expenses and give parents more time with their children. Employees and employers benefit when a person can accept a job with a company in a distant state without having to move. They can live in rural areas instead of big cities and suburbs if they prefer (in "electronic cottages," to use futurist Alvin Toffler's words). Two-career couples can work for companies hundreds or thousands of miles apart.

Problems

Many early telecommuters were volunteers, people who wanted to work at home. They were more likely to be independent workers. (Many were computer programmers.) As more businesses began to require employees to move their offices to their homes, problems arose, for both employees and employers.

Some employers see resentment among employees who must work at the office. Some found that the corporate loyalty of telecommuters weakened. Lacking immediate supervision, some people are less productive, while others work too hard and too long. The ease of working with people around the world leads some to work odd hours to match the time zones of clients. Some employees need better direction about what work and how much work their employer expects them to do at home. Being at home with children is an advantage for some telecommuters, but a distraction for others. Reducing the boundary between home and work causes stress for some workers and their families.

Some employees complain that the costs of office space and overhead that have been reduced for the employer have simply been shifted to the employee who must give up space at home for the office. Some employees believe that by working at home they miss mentoring relationships and opportunities for advancement. For many people, the social interactions and camaraderie at work are a significant part of pleasant working conditions, so social isolation and low morale can be problems.

Problems led some companies to cut back telecommuting programs. Like many of the options new technologies (or social trends) provide, telecommuting may be very desirable for some employees and employers and of no use to others. But it is possible to reduce many problems related to telecommuting. Numerous communication technologies (e.g., email, texting, tweeting, video conferencing) help telecommuters to stay in touch with coworkers. Employers address the social-isolation problem by holding regular meetings and encouraging other activities such as employee sports leagues, where employees interact in person. Telecommuters reduce isolation by participating in activities of professional associations and other social networks. Some companies found significant improvements in employee satisfaction with their telecommuting jobs when they encourage such interactions.

Side effects

Aside from the direct advantages and disadvantages, teleworking has several side effects that might change various business and social aspects of how we live and work.

How does telework affect our sense of community? The Industrial Revolution led to a major shift in work patterns: jobs moved to offices and factories. Working at home in the late 20th century seemed new and unusual, but before the Industrial Revolution, most people worked at, or close to, home. Even in the past few centuries, working at home has not been uncommon. Writers traditionally work at home. Farmers work in the fields, but the farm office was in the house. Doctors, especially in small towns, had their medical offices in their homes. Shopkeepers often had an apartment behind or above the store. Perhaps writers are closest to modern information workers who telecommute in that they tend to work in isolation. Is that why we have an image of writers spending the evenings at coffee houses or at intellectual "salons" talking with other intellectuals? In the past, social isolation was not considered a problem for people who worked in or near their homes. They lived, worked, and socialized in communities. They had the grange, the church, and the community center. Urban policy researcher Joel Kotkin observes that telecommuting may encourage a return to involvement in one's local community.[27] Is he correct? Will being there all day, doing errands locally, eating in local restaurants, and so on, generate an interest in the safety, beauty, and vitality of the community that is less likely to develop when one returns home after dark, tired from a day at the office? On the other hand, now that we can communicate with people all over the world on the Internet, will home workers stay inside, communicating with unseen business and social acquaintances, and be just as unlikely to know their neighbors as many commuters are?

6.2.4 A Global Workforce

Offshoring

Over many decades in the 20th century, as transportation and communications improved, manufacturing jobs moved from wealthier countries to less wealthy countries, especially in Asia. The difference in pay rates was large enough to make up for the extra transportation costs. The Internet and the Web reduced "transportation" costs for many kinds of information work to almost zero. With the ease of working with people and companies in other countries, "offshoring of jobs"* has become a phenomenon and a political issue.

Data processing and computer programming were among the first service jobs to go offshore, many to India. The lure is the large pool of low-skilled workers, in the first case, and well-trained, English-speaking computer programmers, in the second. The example most well known to American consumers is the move of customer-service call centers and software "help desks" to India and other countries. Offshoring takes many other forms too. Companies send "back-office" jobs, such as payroll processing, to other countries. Some

* The term "outsourcing" refers to the phenomenon where a company pays other companies to build parts for its products or provide services (such as marketing, research, or customer service) instead of performing those tasks itself. This is very common. Generally, but not always, the companies that do the work are in the same country as the company that hires them. The term "offshoring" refers to hiring companies or employees in other countries.

hire companies in other countries to manage their computers and networks. Actuaries in India process insurance claims for a British insurance company. Doctors in the United States dictate notes on patient visits and send digitized voice files to India, where medical scribes transcribe them and return text files. Rather than contracting with companies in another country, some large companies set up divisions (for example, for research and development) offshore.

As offshoring of skilled work, sometimes called "knowledge work," increased dramatically, more worries arose about threats of job loss, now for high-paying jobs held by the middle class. Companies send off work in legal services, aircraft engineering, biotech and pharmaceutical research, and stock analysis and other financial services. Individuals and small businesses hire people in other countries for services such as tutoring and designing logos and websites. Information technology jobs still make up the largest segment of offshored jobs, and India and China are the main destinations.* In some fields, a significant reason for offshoring is that there are not enough trained professionals in the United States. For example, Steve Jobs told President Obama in 2011 that Apple had 700,000 factory workers in China because 30,000 engineers are needed on site in the factories and Apple cannot find enough qualified engineers in the United States. Jobs also said it is easy to build a factory in China but very difficult in the United States because of regulations and unnecessary costs.[28]

The impact of offshoring

The BLS reports that a very small percentage of mass layoffs (50 or more people for more than a month) come from offshoring jobs. However, offshoring will probably increase. How far can it go? Economist Alan Blinder, a former vice chair of the Federal Reserve, studied the types of knowledge and service jobs that could be performed at distant places—candidates for offshoring in the near future.[29] He estimated that 28–42 million people currently work in such jobs in the United States. Thus, he sees offshoring as potentially very disruptive. However, Blinder emphasizes that offshoring means massive transition, not massive unemployment.

Many social scientists, politicians, and organizations view the globalization of the workforce as a terribly negative phenomenon, one of the negative results of information and communications technology and corporate greed for increased profit. From the prospective of workers in developed countries, they argue, it means millions fewer jobs, accompanied by lower pay and a reduced standard of living.

The lost jobs are obvious. Our discussion in Section 6.2.1 about jobs eliminated and created by computer and communications technology suggests we consider how offshoring creates new jobs. Lower labor costs and increased efficiency reduce prices for consumers. Lower prices encourage more use and make new products and services feasible.

* Additional destinations include Canada, Brazil, and Ireland, among others.

Inshoring: Two perspectives

Americans working for foreign companies

Americans used to import cars from Japan. Now Japanese car makers build cars in the United States. Otto Bock Health Care, a German company that makes sophisticated microprocessor-controlled artificial limbs, "offshores" research, development, and manufacturing to several countries including the United States (and China). The German software company SAP employs thousands of people in the United States. Offshoring for a German company means "inshoring" for the United States. People in the United States work for Sony, Ikea, Bayer, Novartis, Unilever, Toyota. Overall, almost 5% of U.S. workers work for foreign companies, and those jobs pay more than the U.S. median. Indeed, as the information technology industry grew in India, large Indian companies began offshoring thousands of jobs to the United States and Europe. In a global, interconnected economy, offshoring is one more way of providing products and services to consumers more effectively.

Indian perspectives[30]

For many years, Indian computer scientists and engineers flocked to the United States for jobs, wealth, and entrepreneurial opportunities, while Indian IT companies performed services and provided call centers for foreign companies. Critics, from the Indian perspective, feared a talent drain. They worried that India was not growing its own high-tech industry. Some companies that had developed their own software products stopped doing so, in order not to compete with the U.S. companies for which they provide services.

Over time, more positive results seemed to develop. India's information-technology companies began to provide sophisticated services well beyond the call centers many Americans encounter. They develop and service software. "Offshored" jobs provide professional training and experience, including experience working in a global business environment. They provide confidence and high salaries that permit the savings so helpful for taking risks and starting one's own company. An Indian entrepreneur observes that Indian culture generally had a negative view of entrepreneurs, but that is changing. Some highly trained Indian computer scientists and engineers who went to the United States for jobs are returning to work or start businesses at home. Providing information technology services for foreign companies, from low-level services to highly sophisticated work, is now a multibillion-dollar industry in India.

Manufacturing of computer hardware went offshore early. That was responsible for part of the drop in the cost of hardware; the resulting lower prices contributed to the enormous growth of the industry. The United States is an exporter of services (banking, engineering, and accounting, for example). The same technologies that facilitate offshoring make it easier and cheaper for U.S. service companies to sell more of their services to other countries. Offshoring creates jobs for both low- and high-skilled workers in less wealthy countries. The combination of increased income and reduced prices for goods and services helps grow the economies of these countries. This is likely to yield more jobs on both sides.

Blinder believes that we should plan for a major shift in the United States toward jobs that require presence. His examples, from taxi driver to doctor, include both low-skill and high-skill jobs. He opposes attempts to stop offshoring, but he also warns that we must prepare by shifting emphasis in education. He expects that the flexibility of the U.S. economy will help it adapt more quickly and successfully to offshoring than developed countries with more rigid economies.[31] As we observed in Section 6.2.1 about technology-induced job loss, long-term gains from new jobs are little comfort to people who lose theirs. Helpful responses to the personal and social disruptions offshoring can cause include those we mentioned in Section 6.2.1, among them: flexibility, planning, and changes in educational programs.

Problems and side effects of offshoring

As customers and companies have found, offshoring has problems.

Consumers have many complaints about customer service call centers in foreign countries: Foreign accents are difficult to understand. Service personnel are not familiar with the product or service the consumer is asking about—they just read from a manual. The workers experience problems too. Because of time differences, customer service workers in India work at night. Some find the relatively high pay worth the disruption to their lives; others quit. Problems of customer satisfaction, training, and less-than-expected savings led some companies to conclude that offshoring did not work well for them. (Some developed other cost-saving arrangements. For example, a hotel chain and flower seller agreed to share call center employees in the United States.)

Employees in companies that send projects offshore find they need new job skills. A software engineer, for example, might need to manage people and projects in other countries. Managers and businesspeople find they must schedule meetings during the work hours of workers in another country.

Some small technology companies have found that increased demand for highly skilled workers in India has already forced salaries up. One U.S. entrepreneur said salaries of engineers he hired in India went from 25% of U.S. salaries to 75% within two years. Hiring them is no longer worthwhile for his company.

The problems of offshoring should not surprise us. A theme running through this book is that new things often have unexpected problems. We discover them and find solutions, adapt to changes, or decide not to use certain options. Basic economics tells us that salaries will rise in offshoring destinations. When the gap between salaries in the home and destination countries is no longer big enough to cover the other expenses of offshoring, the trend will decline.

> *When products cross borders, bullets don't.*
>
> —Unknown

Ethics of hiring foreign workers

There is much controversy about both the economics and ethics of offshoring. In this section, we apply some of the ethical theories from Chapter 1 to analyze the practice from an ethical perspective. This is a good example for trying to distinguish economic advantage from ethical arguments. Several countries have passed legislation to restrict the hiring of foreign workers for some industries. The discussion here might provide insight into the ethics of such legislation. Here is the scenario we examine:

> You are a manager at a software company about to begin a large software project. You will need to hire dozens of programmers. Using the Internet for communication and software delivery, you can hire programmers in another country at a lower salary than programmers in your country. Should you do this?[32]

For the discussion, we assume the software company is in the United States and the manager is choosing between U.S. and Indian programmers.

The people most obviously affected by the decision in this case are the Indian programmers and the U.S. programmers you might hire. To generate some ideas, questions, and observations about these two groups, we will use utilitarianism and Kant's principle about treating people as ends in themselves. How can we compare the impact on utility from the two choices? The number of people hired will be about the same in either case. There does not appear to be any reason, from an ethical point of view, for placing a higher weight on the utility of one group of programmers merely because of their nationality. Shall we weigh the utilities of the programmers according to the number of dollars they will receive? That favors hiring the U.S. programmers. Or should we weigh utility by comparing the pay to the average salary in each country? That favors hiring the Indians. The utility obtained from a job for an individual programmer depends on the availability of other jobs. Are there more opportunities to earn a comparable income in the United States or in India? We see that a calculation of net utility for the programmers depends on how one evaluates the utility of the job for each group of programmers.

What happens when we apply Kant's principle? When we hire people for a job, we are interacting with them in a limited role. We are making a trade, money for work. The programmers are a means to an end: producing a marketable product at a reasonable price. Kant does not say that we must not treat people as a means to an end, but rather that we should not treat them merely as such. Kant does not seem helpful here, especially if we observe that the hiring decision does not treat the potential programmers of the two countries differently in a way that has to do with ends and means.

Are you taking advantage of the Indian programmers, perhaps exploiting them by paying them less than you would have to pay the U.S. programmers? Some people believe it is unfair to both the U.S. and Indian programmers that the Indians get the jobs by charging less money. It is equally logical, however, to argue that paying the higher rate

for U.S. programmers is wasteful, or charity, or simply overpayment. What makes either pay level more "right" than the other? Buyers would like to pay less for what they buy, and sellers would like to get a higher price for their goods and services. There is nothing inherently unethical about choosing the cheaper of two products, services, or employees.

We can argue that treating the Indian programmers as ends in themselves includes respecting the choices and trade-offs they make to better their lives according to their own judgment, in particular in offering to work for lower wages than U.S. programmers. But there are special cases in which we might decide otherwise. First, suppose your company is doing something to limit the other options of the Indian programmers. If your company is lobbying for U.S. import restrictions on software that Indian firms produce, for example, thus decreasing the availability of other programming jobs in India, then you are manipulating the programmers into a situation where they have few or no other choices. In that case, you are not respecting their freedom and allowing them to compete fairly. You are, then, not treating them as ends in themselves. We will assume for the rest of the discussion that your company is not doing anything like this.

Another reason we might decide that the Indian programmers are not being treated as ends in themselves, or with respect for their human dignity, is that their working conditions would be worse than the working conditions that U.S. workers expect (or that law in the United States requires). The programmers might not get medical insurance. They might work in rundown, crowded offices lacking air-conditioning. Is hiring them to work in such conditions unethical, or does it give them an opportunity to improve conditions in their country? Whether or not it is ethically required, there are several reasons why you might pay more (or provide better working conditions) than the law or market conditions in India require: a sense of shared humanity that motivates you to want to provide conditions you consider desirable, a sense of generosity (i.e., willingness to contribute to the improvement of the standard of living of people in a country less rich than your own), and benefits for your company. Paying more than expected might get you higher morale, better productivity, and increased company loyalty.[33]

Often, in various countries, a large group of potential workers (foreigners, recent immigrants, ethnic minorities, low-skilled workers, teenagers) is willing to work for lower than the standard pay. Governments have passed laws to require that the same salary be paid to all. The main argument is that such laws will prevent employers from exploiting the less advantaged workers. Historically, one of the effects of these laws is that the traditionally higher-paid group gets most of the jobs. (Often that has been the intent of the law.) In this case, the almost certain result would be hiring the U.S. programmers. The law, or an ethical requirement that the pay of the Indian programmers and the U.S. programmers be the same, would protect the high incomes of programmers in the United States and the profits of companies that pay higher salaries. New workers or businesses that are trying to compete by lowering prices generally oppose such requirements.

Your decision affects other people besides the programmers: your customers, the owners or stockholders of your company, and, indirectly and to a smaller degree, many

people in other businesses. Hiring the Indian programmers increases the utility of your company and customers. The customers benefit from the lower price of the product, and the owners of the company benefit from the profits. If the product is successful, your company might pay for advertising, distribution, and so on, providing jobs for others in the United States. On the other hand, if you hire U.S. programmers, they will spend more of their earnings in the United States than the Indian programmers, generating jobs and income for others in the United States. If the product is not profitable because of higher programming costs, the company could go out of business, with a negative impact on all its employees, owners, and suppliers. To which of all these people do you have responsibilities or obligations? As a manager of the company, you have an obligation to help make the product and the company successful, to manage the project to make a profit (not in a manner independent of ethical considerations, as we noted in Chapter 1, but consistent with them). Unless the owners of the company have a policy to improve the standard of living of people in other countries or to "Buy American," your obligation to them includes hiring competent workers at the best price. You have some responsibility for the fate of other company employees who might lose their jobs if you do a poor job of managing the project. You do not have any special obligation to other service providers you could hire, nor to people seeking jobs as programmers in either country.

Although hiring lower-paid workers in other countries is often described as ethically suspect, this discussion suggests that there is no strong ethical argument for that view.

6.3 Employee Communication and Monitoring

6.3.1 Learning About Job Applicants

Employers have long done various forms of screening, including criminal background checks, on prospective employees. The Web and social media provide a vast new collection of information on job applicants.* Some employers read applicants' blogs to learn how well they write. Some hire companies that specialize in performing extensive background checks using publicly available social media. The *New York Times* lists a variety of behaviors that one company includes in the dossiers it provides to employers about prospective employees: racist remarks, references to drugs, sexually explicit material, displays of weapons or bombs, and violent activity. (It includes positive information too—for example, charitable work.) The company does not include race, religion, and other information that laws prohibit companies from asking about, but, of course, now it is not difficult for an employer to find such information in social media.[34]

Many privacy advocates object to social media searches on job applicants. Some argue that employers should restrict the information they collect about applicants to what is

* In Section 6.3.2, we look at the issue of employers firing employees because of material in social media.

directly related to job qualifications. Marc Rotenberg, president of the Electronic Privacy Information Center, expressed the view that "employers should not be judging what people in their private lives do away from the workplace."[35] This view has merit and might be the best policy for many employers.[36]

It is important to maintain and protect a barrier between work and personal activities. Most people work (and engage in social activities such as the community softball team) with people whose religion, hobbies, and tastes in humor differ from theirs. There is great value in interacting with diverse people. It is better to avoid employment policies with a side effect of stiffling expression of those differences outside of work. However, there does not appear to be a convincing ethical argument that an employer *must* consider only information related to the specific job an employee will do, ignoring all other aspects of how the employee will behave at work. Some things an employer might learn about an applicant could affect safety and security at the workplace, the image the company wishes to maintain, and the likelihood of future lawsuits related to an employee's behavior. An employer has no ethical obligation to hire a specific applicant. The number of people hired is not likely to be affected by a policy of using social media information, so (if we value each applicant equally) the overall utility, in the utilitarian sense, is not affected. Employers use a variety of screening methods to efficiently reduce a large pool of applicants to a small number for further consideration. Some routinely reject people who do not have a college degree, even though some of those people could do the job well. An employer that frequently hires suboptimal employees (either by applying poor screening criteria or by not using—or by misusing—relevant social media information) may see its operations suffer. The employer has the most stake in choosing applicants who are likely to be an asset to the company or organization.

Making a responsible and reasonable employment decision based on social media information can be difficult. A person who posts a dozen photos of himself or herself surrounded by a variety of guns might be an avid hunter or sport shooter who would be an excellent employee. Or he or she might be one of those rare people who come to work one day and shoot fellow employees. Information in social media might be inaccurate. A person other than the applicant might have posted questionable material. Some employers are overcautious and decline to hire an applicant if something negative turns up, without exploring the context or determining the accuracy of the information. Is this unethical or a poor policy or an acceptable (if sometimes unwise) choice to emphasize caution and efficiency?

There are ways to help protect applicants' privacy and reduce the consequences of errors when employers choose to do social media searches. One is to use a "third-party" company to perform the searches. The company that is hiring employees never sees information that is deemed to be inappropriate (by law or by the policies of the hiring company or by the policies of the search company). This can protect the applicant's privacy and protect the employer from complaints that it used inappropriate information in the hiring decision. An employer can (and should) make its policy about searches clear to

Verifying workers[37]

It is illegal for an employer in the United States to hire an illegal immigrant or a legal immigrant without legal authority to work. Some employers hire illegal workers knowingly and some hire them unknowingly. Over the years there have been many proposals and pilot programs in which employers verify each job applicant's legal status by checking an automated system maintained by a federal government agency. The current system, E-Verify, uses data from the Social Security Administration and the Department of Homeland Security (DHS). Approximately 200,000 employers use E-Verify. Some states require it, and the federal government requires it for federal contractors. Some people advocate requiring that all employers get approval from E-Verify for each new person hired.

One threat of such a system is the loss of liberty to work. "It is absolutely unprecedented," said congressman Steve Chabot, "to say that the government must grant affirmative permission every time any employee is hired."[38] Any large and frequently changing database is bound to have errors. The U.S. Government Accountability Office (GAO) reported that E-Verify immediately verifies 97.4% of applicants as authorized to work. The system incorrectly rejects 0.3% whom it later approves after a process to correct the error. The government considers the rest unauthorized to work. The initial rejection rate is higher in areas with large immigrant populations. Among other reasons, inconsistencies in the spelling of names cause rejections. The 0.3% initially rejected but approved after a correction process does not include all the incorrect rejections of legal workers. There are many reasons why legal applicants do not appeal a rejection or are not successful in their appeal. The GAO reported that individuals face formidable challenges in getting errors corrected. In some cases, the employer simply declines to hire the applicant without telling him or her why. On the other hand, the GAO reports that the system approves more than half of the applicants who are truly unauthorized to work in the United States because of identity theft and employer dishonesty. (Of course, this rate is difficult to determine precisely.)

Approximately 60 million people in the United States change jobs or enter the workforce every year. If the system becomes mandatory, an error rate of 0.3% incorrect initial rejections would affect 180,000 people who are legal workers each year.

Summing up other risks, the Electronic Frontier Foundation and other critics said: "A nationwide mandatory E-Verify system would be one of the largest and most widely accessible databases of private information ever created in the U.S. Its size and openness would present an irresistible target for identity thieves. Additionally, because the system would cover everyone eligible to work in the United States, it could quickly expand to a host of other uses . . . "[39]

Does the system do its intended job well enough to balance the risks to privacy and the right to work?

applicants. Search companies can have a policy that they perform social media searches only if the applicant consents. The search company can inform an applicant if it provides the employer with negative information, so the applicant has an opportunity to correct errors or explain the context of the information. Some companies that do social media searches follow these policies.

Some people, about to seek a job, try to clean up their online persona. They remove raunchy material, change their "favorite book" to one that appears intellectual, and so on. Some craft online profiles as carefully as people craft résumés. Of course, this means that some profiles are not reliable descriptions of a person, but that is no longer a surprise. On the other hand, some people naively think their blogs are invisible to prospective employers. They criticize the companies they are interviewing with and wonder why they did not get the job. In either case, it is extremely difficult to remove all the negative information and photos a person (or his or her friends) released to cyberspace.

It is common for people to google someone they have begun to date—or almost anyone they meet. We should not be surprised that employers learn about potential employees via social media. We might hope for a civility, a courtesy, a social convention that we—and employers—do not look at what was not intended for us (or them). Is this foolish? Is it achievable? Is it consistent with the culture of the Web and social media?

6.3.2 Risks and Rules for Work and Personal Communications

Employers have always monitored the work of their employees. The degree of detail and frequency of the monitoring has varied depending on the kind of work, economic factors, and available technology. Logs or time clocks measured total hours worked. Supervisors listened in on the work of telephone operators and customer service representatives. The electronic monitoring capabilities that employers use now are the modern version of the time clock and telephone extension. These capabilities have made old methods more efficient and new kinds of much more extensive monitoring possible. Most precomputer monitoring was not constant, because the supervisor had many workers to oversee and other work to do. Workers usually knew when the supervisor was present to observe them. Now, monitoring can be constant, more detailed, and unseen by the worker. Newspaper editors, senior lawyers, and customer service supervisors can remotely observe the computer screens of the workers they supervise. In retail environments, software monitors transactions at the cash registers, looking for suspicious patterns (for example, a large number of refunds, voids, or sales of cheap items) that might indicate employee theft.* The vast growth of storage capabilities means that employers can store enormous amounts of surveillance information for a long time.

Email, smartphones, social networking, Twitter, and so on, enhance work-related communications and make a lot of work more efficient and more pleasant, benefiting

* Theft by retail-store employees exceeds losses from shoplifting.[40]

both employers and employees. They can also be a distraction, a security leak, and a source of lawsuits. Personal social media content, outside of work, can get a person fired. We focus in this section on workplace rules for use of these tools and at monitoring employee communications and cyberspace activity at work and outside work.

Separating—or merging—work and personal communications

In many work environments, employers prohibit employees from using their work email, computers, and other devices for personal use. Among other reasons, content in some personal messages coming from a business address could embarrass the business or subject it to legal problems. (Where businesses archive all email, it could later embarrass the employee.)

What about employees using personal email accounts, social media, laptops, smartphones, and other devices for work? As cellphones have become smarter and more people have gotten used to a variety of ever-new electronic gadgets and social media applications, many workers (especially professional workers) find the tools their employers provide to be less convenient or less versatile. Telecommuters are likely to use the same computer for both personal and work activities. It might seem surprising that some employers prohibit employees from using personal media and devices for work. We consider some of the reasons.

From the employer's perspective, there are two main problems with use of personal devices for work. One is the overhead of managing and maintaining systems to work with the variety of brands and operating systems on the employees' various devices. The other, more serious, is security of company information and operations. Security on some smartphones is not as strong as on, for example, BlackBerry devices that employers favor. An employee might carry a personal device to more places with more opportunity to lose it or for someone to steal it. When an employee leaves the company for any reason, the employer cannot demand the he or she turn over a personal phone or tablet—even though it likely contains confidential client information and company files.

In government agencies, email is part of the official record and is subject to public disclosure (with some exceptions). Some government officials use their personal email specifically to keep communications "off the record." This practice subverts rules about openness in government. It also can have serious security risks. In Chapter 5, we mentioned that a hacking attack on the Gmail accounts of high-level government officials originated in a Chinese city where a major Chinese national security division is located. The U.S. government assured the public that personal email, not government email, was compromised. It is not unlikely, however, that the hackers expected to find, and did find, sensitive government content.

Some employers accept the trend toward using personal devices for work and develop policies and rules to reduce risks. Simple examples include requiring that employees always use a password to access their device. More sophisticated are techniques to remotely erase a device if it is lost or stolen—or if the employee leaves the company. Information on

some devices can be separated into a personal area and a secure work area, where only the latter is remotely erased. If such a separation is not utilized and an employer erases the entire device, the employee might lose a huge amount of valuable personal information. The policy about erasing a device must be made clear to employees.[41]

We explained in Section 5.2.5 that the original intent and design of the Internet and the Web was to share information, not to create a secure environment. The same is true for social media and many popular consumer wireless devices. As we saw in Chapter 5, the openness of the Internet led to many problems of intrusions, privacy loss, thefts of information, and malicious disabling of computer systems and websites. Similar problems afflict personal devices and software that employees use for work. Thus, security remains a significant issue for employers.

Some employers have a policy that employees may not install any software on their (work) computers or laptops other than what the employer provides. Some employers, for example, prohibit games. To someone who travels for work, this might seem silly or overly restrictive. Why not install a game to play while commuting or on a plane? Why not download music to listen to while working? Again, one of the main reasons is security: to protect against viruses or other malware that could disable the system or leak confidential company information or personal data. (In one case, investigators believe that after an Arizona police officer installed peer-to-peer software, hackers used it to collect personal information, photos, and email addresses of several police officers.) Another purpose is to keep copyright-infringing software off the employer's computers to avoid legal trouble. What degree of restrictions make sense? The answer varies with the particular industry and the kind of work done.

Monitoring employer systems

Roughly half of major companies in the United States sometimes monitor the email or voice mail of their employees on company systems. Various surveys find high percentages of employees at businesses and government agencies use the Web at work for nonwork purposes. Visits to "adult" and pornography sites, when the Web was new, gave way to sports, shopping, gambling, and stock-investment sites, then to watching videos, downloading music, and networking with friends. Many major companies use software tools that provide reports on employee Web use. The tools rank sites by frequency of visits or create reports on an individual employee's activity, for instance. About 25% of companies in a 2011 survey block access to social network sites.[42] Monitoring raises privacy issues. Employers claim they have a right and a need to monitor the use of their facilities and what employees are doing at work. Controversies stem from disagreements about the reasons for monitoring and the appropriate boundary between the employers' rights and the employees' privacy.

Purposes of monitoring employee communications include training, measuring or increasing productivity, checking compliance with rules for communications, and detecting behavior that threatens the employer in some way. Figure 6.1 lists a variety of purposes.

- Protect security of proprietary information and data.
- Prevent or investigate possible criminal activities by employees. (This can be work related, such as embezzlement, or not work related, such as selling illegal drugs.)
- Check for violations of company policy against sending offensive or pornographic messages.
- Investigate complaints of harassment.
- Comply with legal requirements in heavily regulated industries.
- Prevent personal use of employer facilities (if prohibited by company policy).
- Locate employees.
- Find needed business information when the employee is not available.

Figure 6.1 Reasons for monitoring employee communications.

Many large companies rank leaking of proprietary information as a serious problem. Some businesses filter all outgoing messages for content that violates laws or company policy, could damage relations with customers, or could expose the company to lawsuits. The box on page 300 describes an application of email filtering in the stock brokerage industry. The health industry is another example where very strict federal rules apply to patient information to protect privacy; health businesses and organizations must ensure that employees do not violate the rules. Other problems are harassment (including sexual harassment, cases with pending divorces, and love triangles), sending jokes to thousands of people, running a business using the company's address, personal communications, and running betting pools on football and basketball games. Employee email led to lawsuits against more than 15% of companies in one survey, and 26% of employers said they had fired employees for misusing company email.[43] Most companies that read employee communications do it infrequently, primarily when there is a complaint or some other reason to suspect a problem. At the other extreme, some employers routinely intercept messages entering and leaving the company site. Some supervisors snoop to find out what employees are saying about them or the company.

Is nonwork Web use at work a serious problem for employers, or is it the modern equivalent of reading a newspaper, listening to the radio, or making a quick personal phone call at one's desk? One large U.S. company found that on a typical day, employees viewed 50,000 YouTube videos and listened to 4000 hours of music. These activities caused a significant slowdown of the company's Internet service.[44] Another obvious concern about nonwork Web activity is that employees are not working the hours they are paid to work. (On the other hand, a company found that one of its top-performing employees spent more than an hour a day managing his own stocks on the Web. The company did not care because his performance was good.) Some psychologists argue

Filtering professional email

Most major stock brokerage companies use email filters to detect illegal, unethical, and offensive email sent by their brokers. Stock brokers are not supposed to exaggerate the prospects of investments, downplay the risks, or pressure clients to buy or sell. Filters search for keywords such as "risk-free," vulgarities, and sexist or racist terms. They use AI techniques for more sophisticated analysis of messages.[45]

Is this an example of increased monitoring that technology makes possible? Not entirely. To protect the public, the New York Stock Exchange previously required that a supervisor read all written communication from brokers to clients. When email replaced mailed letters, the volume increased so much that supervisors could no longer read all the mail. Email filtering replaced human review of all messages with human review of only those selected by the filter.

Brokers use email for a greater variety of messages than they did printed letters—including personal messages, which now may be exposed to filters and archiving requirements. Does routine filtering violate the privacy of the brokers? If it does, do the trade-offs justify it? What rules are brokerage companies likely to establish for use of social media by brokers to communicate with clients?

that allowing some personal online activity improves employee morale and efficiency. Companies remain concerned about security and other risks. Viruses and other malicious software that an employee might download have the potential to disrupt company operations or to access sensitive data about the company or its customers and clients. Also, some companies want to avoid the embarrassment of having their employees reported to be visiting pornographic sites, perhaps racist sites, or even job-hunting sites.

Law and cases for employer systems

Monitoring for purposes listed in Figure 6.1 is generally legal in the United States and other countries.[46] The Electronic Communications Privacy Act (ECPA) prohibits interception of email and reading of stored email without a court order, but the ECPA makes an exception for business systems. It does not prohibit employers from reading employee email on company systems. Some privacy advocates and computer ethicists advocate a revision of the ECPA to prohibit or restrict employers from reading employee email.

ECPA: Section 2.6.1

In one case, a company fired two employees after a supervisor read their email messages criticizing him. A judge ruled that the company could read the email because it owned and operated the system. In another case, a court accepted monitoring of a discussion about a boss because the discussion could affect the business environment. Courts have made similar decisions in other cases. In addition, courts generally allow employers to look at messages an employee sends or receives on personal email accounts if the employee uses the

employer's computer system or mobile device to do so. In a few cases, courts ruled against an employer for reading email sent at work but on a personal account between an employee and the employee's attorney. The longstanding principle of attorney-client privilege protects such correspondence. However, in at least one case in which the employee used the company's email system for correspondence with her attorney in violation of a clear policy that prohibits personal use of the company system, the court ruled in favor of the employer who read the messages.[47] A court ruling summed up a typical conclusion: "[T]he company's interest in preventing inappropriate and unprofessional comments, or even illegal activity, over its e-mail system would outweigh [the employee's] claimed privacy interest in those communications."[48]

Employees do not give up all privacy when they enter an employer's premises. The bathrooms belong to the employer too, but camera surveillance in bathrooms is generally not acceptable. Courts have sometimes ruled against employers if there was a convincing case that monitoring was done to snoop on personal and union activities or to track down whistleblowers. Workers have a legal right to communicate with each other about work conditions, and the National Labor Relations Board, which decides cases about worker–employee relations, ruled in some cases that they may do so on company systems. Thus, employers may not prohibit all nonbusiness communications.[49]

Court decisions sometimes depend on a conclusion about whether an employee had a reasonable "expectation of privacy." Several decisions emphasize the importance of a company having a clear policy statement. An employer should inform employees clearly about whether it permits personal use of employer-provided communications and computer systems and whether, and under what circumstances, the employer will access employee messages and files. The employer should make clear how it treats messages in personal accounts sent through the employer's equipment. A clear policy removes some of the guesswork about expectations of privacy.*

Expectation of privacy: Section 2.2.2

Clear policy statements are important from an ethical perspective as well. Respect for an employee's privacy includes warning the employee about when someone is observing his or her apparently private actions or communications (except in special circumstances such as a criminal investigation). Giving or accepting a job in which an employee will use an employer's equipment carries an ethical obligation on both parties to abide by the policy established for that use. From a practical perspective, a clear policy can reduce disputes and abuses (by employees or employers).

So far, we have been discussing cases in which an employee argues that an employer invaded the employee's privacy. Is an employee who violates an employer's policies about use of the employer's computer systems commiting a crime? Prosecutors have brought

* Some court decisions indicate that an employer does not have to specify each specific technology that the policy covers. The employee should assume that a policy for the employer's laptops and phones, for example, applies to a tablet or a newly invented device.

criminal charges against employees for doing so. In Section 5.2.6, we described unintended applications of the Computer Fraud and Abuse Act (CFAA). This is another. The CFAA was intended for hacking. Several courts have allowed prosecutions of employees, saying the wording of the law (if not the intent) covers violations of an employer's policies. Others reject this interpretation, saying it would make federal criminals of millions of ordinary people who play a game or do some shopping on a work computer in violation of the employer's rules.

Personal social media

Almost a third of multinational companies said in a survey that they took disciplinary action against employees for misuse of social networks.[50] In many instances, employers learn about questionable content after hearing complaints or after another employee shows it to a supervisor. Basing disciplinary action on personal, nonwork social media is more controversial than monitoring employer communications systems because it extends employer control beyond the workplace.

Are there good reasons for employers to be concerned about what their employees post in such places? Is it reasonable for employers to fire employees for content of their blogs, tweets, or posts on social networks? Consider some of the wide variety of reasons for such firings. A school district fired a teacher because of a photo of her drinking in a bar. A school district declined to rehire a teacher who communicated with students on a social network and included pictures of naked men with his profile. An actor was fired for tweeting jokes about the horrific tsunami in Japan. A restaurant fired a server for complaining on a social network about an inconsiderate, low-tipping customer; the server had included the name of the restaurant. A police department demoted two officers for a cartoon video on YouTube that poked fun at the operation of a local jail. A nonprofit social services organization fired five employees for a discussion on Facebook criticizing their working conditions and the job performance of another employee.[51] These examples suggest a variety of concerns for the employer, from protection of students to protection of the employer's image and reputation (reasonably in some examples, unreasonably where criticism is deserved). Content in social media is often widely distributed; thus, the impact is far stronger than that of a private conversation.

A frequent question is whether employer restrictions on nonwork social media violate an employee's freedom of speech. Employers prohibit various kinds of speech—for example, disparaging the employer or its customers in public, trash talking about competitors (a common restriction for sports teams), disclosure of any information about clients (a common restriction in health and financial fields), and any discussion of new products or business plans. These are conditions of the job; they do not violate the First Amendment (unless, in some cases, when the employer is the government). On the other hand, people should be free to discuss and criticize working conditions and to report abuses of power. The social service agency said the five employees it fired violated its policy against bullying and harassment, but a judge said that a law allowing discussion of working conditions protects their discussion. Clearly, some discussions will fall on one side of the permissible

line and others will not. A decision about the ethics of the firing in many cases depends on the actual content of the material in question, how widely it was distributed, the type of employer, and perhaps other criteria. What about the restaurant server? In what ways might her action differ from that of the social service employees?

Was the police officer who poked fun at the local jail acting in a way "unbecoming an officer," or was he exercising his freedom of speech? In a less controversial firing (but more ugly incident), an Australian police force fired four officers and disciplined more than a dozen others for circulating racist, homophobic, and pornographic email, joking about the death of an Indian man. In this case, the officers used department computers. Would the firings and discipline have been less justifiable if they had used personal email or social media?

A problem, for both ethics and law, consists of defining a reasonable boundary between, on the one hand, the employer's property rights, protection of company assets and reputation, protection of clients or the public, and the need to monitor for possible legal and liability problems, and, on the other hand, actions that invade privacy and restrict employees' reasonable freedom of expression. The most reasonable policy is not always obvious, not always the same in the view of both parties, not the same for all types of businesses, and not always clear when new situations arise.

Monitoring location and equipment usage

Employers supply smartphones and other location devices that tell a supervisor where an employee is at all times. In the box on page 304, we illustrate some issues of location surveillance with one example—long-haul truckers. Heavy equipment companies install similar monitoring devices in their equipment. One company learned that their workers let engines run to keep the air conditioning on while they ate lunch in the vehicle's cab. The company stopped the practice, which had used up thousands of dollars in extra fuel. Is this an advantage (saving money and energy), or is it unfair to the workers?

Electronic identification badges that serve as door keys raise similar issues. They provide increased security for a business, but they allow monitoring of the movements of employees. Nurses in some hospitals wear badges that track their location; a supervisor at a terminal can see where each nurse is. That means supervisors can see who someone eats lunch with and when they go to the bathroom. On the other hand, they can also locate nurses quickly in emergencies. Would a call on a public-address system do just as well?

City governments give cellphones to employees so that supervisors can determine where employees are at all times (while at work). Building inspectors in Massachusetts refused the phones, calling them an invasion of privacy. Is it reasonable for a nurse or a city employee working out in the field to expect his or her location, while working, to be private? Should employer policies permit employees to turn off locating devices when they are on a break? Again, good sense is valuable in making reasonable choices. Most decisions about such questions are wise or unwise, rather than ethically required or ethically prohibited.

Tracking truckers[52]

In the late 1980s, shippers began installing tracking systems in their long-haul trucks. Now, most trucks have such devices. They can report the location and speed of the vehicle, as well as such other details as when the driver turns on the headlights.

These systems enable more precise planning of pick-ups and deliveries, increases in efficiency, reductions in energy use, and reductions in expenses. Companies can use data on speed and rest periods to ensure that drivers follow safety rules. Trucks loaded with valuable goods and construction vehicles themselves are targets for thieves. Owners recovered more than a hundred stolen trucks in one year because the thieves did not know about the tracking devices. Before cellphones were available, the tracking systems facilitated communication about schedule changes, road conditions, breakdowns requiring a mechanic, and so on.

The main disadvantage is that many drivers saw the system as an intrusion on their privacy, a "Big Brother" device watching their every move. Companies can micromanage the driver's actions and decisions, decreasing individual discretion. When the devices were first introduced, some truckers wrapped foil over the transmitter or parked for naps under highway bridges.

Do the benefits of tracking and monitoring outweigh the privacy intrusion, or is this an example of computer technology inappropriately infringing on privacy and worker autonomy? Does the advent of cellphones reduce the advantages significantly?

EXERCISES

Review Exercises

6.1 List two job categories where the number of jobs declined drastically as a result of computerization.

6.2 List two job categories where the number of jobs increased drastically with increasing use of computers.

6.3 What has been one of the impacts on India of offshoring U.S. jobs to India?

6.4 What are two advantages and two disadvantages of telecommuting?

6.5 Give two examples of material on social networking sites that got someone fired.

6.6 What is one risk of using one's personal phone for work?

6.7 Give two reasons for a company to install software to filter all email sent by employees (from work).

General Exercises

6.8 List four examples from Section 1.2 that reduce or eliminate jobs. Tell specifically what jobs they reduce or eliminate.

6.9 Why is it difficult to determine the number of jobs eliminated and created by computers?

6.10 List ten jobs that did not exist 20 years ago.