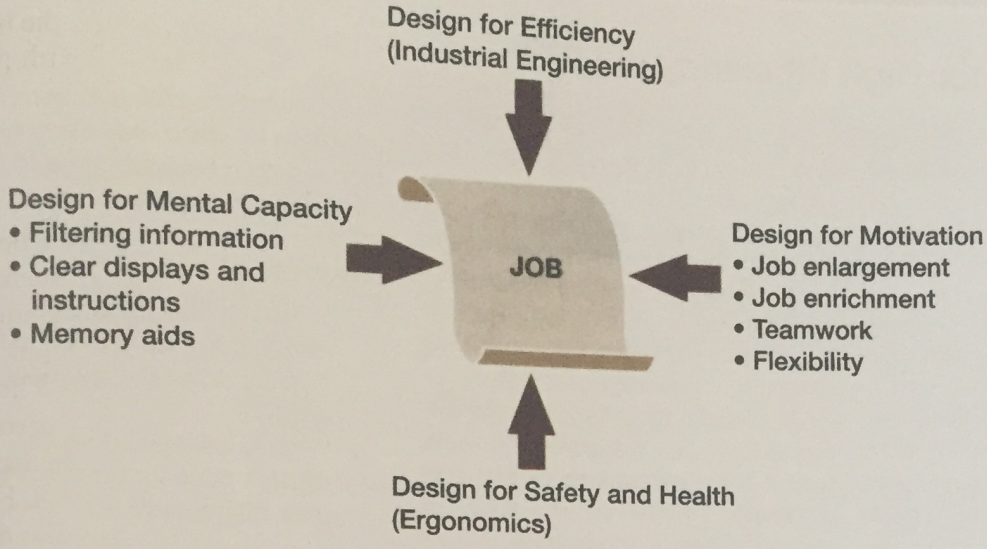


Figure 4.4
Approaches to Job Design

doing a job efficiently, the job's impact on motivation, the use of safe work practices, and the mental demands of the job.

Designing Efficient Jobs

If workers perform tasks as efficiently as possible, not only does the organization benefit from lower costs and greater output per worker, but workers should be less fatigued. This point of view has for years formed the basis of classical **industrial engineering**, which looks for the simplest way to structure work in order to maximize efficiency. Typically, applying industrial engineering to a job reduces the complexity of the work, making it so simple that almost anyone can be trained quickly and easily to perform the job. Such jobs tend to be highly specialized and repetitive.

Industrial Engineering
The study of jobs to find the simplest way to structure work in order to maximize efficiency.

In practice, the scientific method traditionally seeks the "one best way" to perform a job by performing time-and-motion studies to identify the most efficient movements for workers to make. Once the engineers have identified the most efficient sequence of motions, the organization should select workers based on their ability to do the job, then train them in the details of the "one best way" to perform that job. The company also should offer pay structured to motivate workers to do their best. (Chapters 12 and 13 discuss pay and pay structures.) For an example of a company using data analytics to improve efficiency, see "Best Practices."

Industrial engineering provides measurable and practical benefits. However, a focus on efficiency alone can create jobs that are so simple and repetitive that workers get bored. Workers performing these jobs may feel their work is meaningless. Hence, most organizations combine industrial engineering with other approaches to job design.

Designing Jobs That Motivate

LO 4-7 Identify approaches to designing a job to make it motivating.

Especially when organizations must compete for employees, depend on skilled knowledge workers, or need a workforce that cares about customer satisfaction, a pure focus on efficiency will not achieve human resource objectives. Employers also need to ensure that workers have a positive attitude toward their jobs so that they show up at work with enthusiasm, commitment, and creativity. To improve job satisfaction, organizations need to design jobs that take into account factors that make jobs motivating and satisfying for employees.

Best Practices

Big Data for High Efficiency at UPS

United Parcel Service is the world's largest package-shipping company, so saving a tiny bit of gasoline on every truck route can generate enormous savings, both in expenses and in impact on the environment. For example, reducing each route by one mile per day for a year can save the company $50 million. Thus, efficiency is a major factor in work design. UPS keeps improving its ability to gather, analyze, and apply data to making every aspect of package handling use fewer resources. Some of its requirements are as detailed as requiring drivers to hook their truck keys over one finger instead of stashing them in a pocket.

Recently, the company announced that it would begin using a system called Orion (for On-Road Integrated Optimization and Navigation) for its 55,000 drivers in the United States. The Orion system gathers data from customers, vehicles, and drivers' handheld computers. It analyzes the data—even times for pickup and delivery when customers have special requests—and designs routes for each driver to use the minimum time and fuel, driving the minimum distance.

According to UPS, Orion is expected to save the company more than 1.5 million gallons of fuel and eliminate 14,000 metric tons of carbon dioxide emissions in its first year. The company hopes that Orion will eventually do even more to improve outcomes—for example, updating routes when accidents or construction sites cause traffic congestion.

With results like these, it is easy to see why UPS invested years to develop the Orion system. The challenge for managers is to find drivers who are willing to commit to a system in which their every turn is planned by a computer and to keep those jobs engaging.

Questions

1. What benefits does UPS derive from using Orion to help it make drivers' work more efficient?
2. What challenges does the system pose for drivers and their managers?

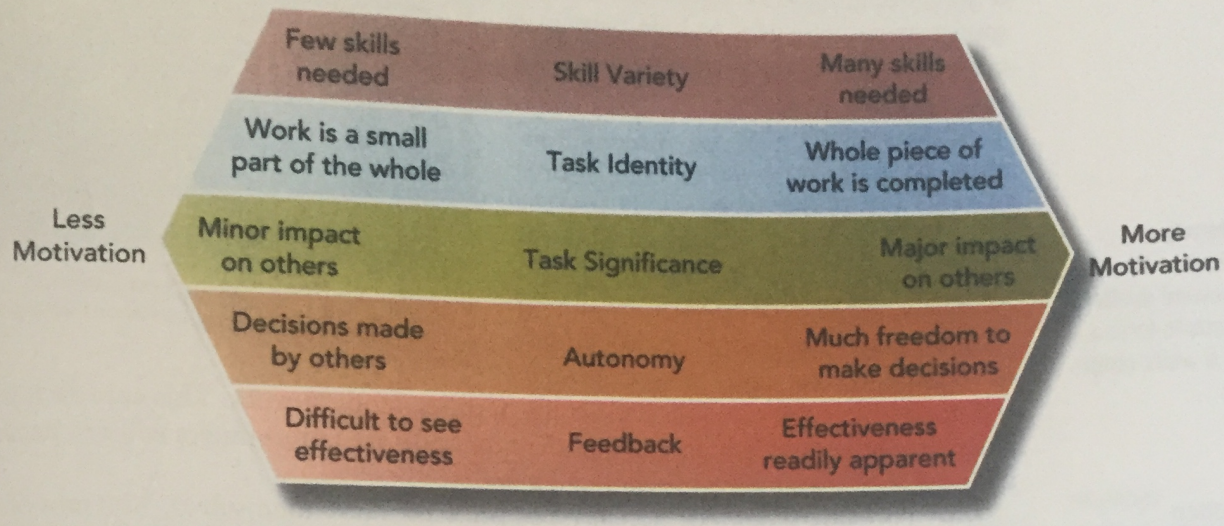
Sources: Thomas H. Davenport, "Big Brown Finds Big Money from Big Data," *Wall Street Journal,* April 9, 2014, http://blogs.wsj.com; Richard Waters, "Big Data Sparks Cultural Changes," *Financial Times,* March 25, 2014, http://www.ft.com; Mary Schlangenstein, "UPS Crunches Data to Make Routes More Efficient, Save Gas," *Bloomberg News,* October 30, 2013, http://www.bloomberg.com.

A model that shows how to make jobs more motivating is the Job Characteristics Model, developed by Richard Hackman and Greg Oldham. This model describes jobs in terms of five characteristics[18]:

1. *Skill variety*—The extent to which a job requires a variety of skills to carry out the tasks involved.
2. *Task identity*—The degree to which a job requires completing a "whole" piece of work from beginning to end (for example, building an entire component or resolving a customer's complaint).
3. *Task significance*—The extent to which the job has an important impact on the lives of other people.
4. *Autonomy*—The degree to which the job allows an individual to make decisions about the way the work will be carried out.
5. *Feedback*—The extent to which a person receives clear information about performance effectiveness from the work itself.

As shown in Figure 4.5, the more of each of these characteristics a job has, the more motivating the job will be, according to the Job Characteristics Model. The model predicts that a person with such a job will be more satisfied and will produce more and better work. An example of such a job is that of senior analyst at Internet Identity (IID), which combats a kind of online scam known as phishing. Suppose a scam artist

Figure 4.5
Characteristics of a Motivating Job



uses the name of a major bank and pretends to represent the bank in messages that ask its customers to visit a Web page and enter their account number. The bank hires IID to find where the phony Web pages are hosted and have them taken down; senior analysts such as Kyle Paris do that detective work. Paris evaluates client requests, analyzes e-mail, studies computer code to identify suspicious practices, and uses detective skills to identify website owners. He directly contacts owners, who may be located anywhere in the world, so he may use a service to translate their conversations. He needs skill in persuasion, because the people hosting the site usually do not even know about the scammers' page and may not see a need to act. Paris also employs people skills to build relationships with clients and Internet service providers. While skill variety and task identity make Paris's work interesting, he especially values his significant role in helping to make the Internet safer for its users.[19] In contrast to his experience, employees in a job that rates low on these characteristics would not find it very motivating.

Applications of the job characteristics approach to job design include job enlargement, job enrichment, self-managing work teams, flexible work schedules, and telework. In applying these methods, HR managers should keep in mind that individual differences among workers will affect how much they are motivated by job characteristics and able to do their best work.[20] For example, someone who thrives in a highly structured environment might not actually be motivated by autonomy and would be a better fit for a job where a supervisor makes most decisions.

Job Enlargement In a job design, **job enlargement** refers to broadening the types of tasks performed. The objective of job enlargement is to make jobs less repetitive and more interesting. Jobs also become enlarged when organizations add new goals or ask fewer workers to accomplish work that had been spread among more people. In those situations, the challenge is to avoid crossing the line from interesting jobs into jobs that burn out employees. In Minnesota, school principals have been asked to stretch beyond their administrative tasks such as staffing, budgeting, and ensuring building security to take responsibility for student success and teacher development. These goals emphasize the basic purpose that likely drew many principals to careers in education. However, the new goals require many additional hours to observe and

Job Enlargement
Broadening the types of tasks performed in a job

evaluate teachers. Schools that can afford it are adding behavior specialists and administration managers to help principals keep schools running as they focus on their new priorities.[21]

Nordstrom empowers its employees to resolve customer problems, which can enhance their job experience.

Organizations that use job enlargement to make jobs more motivational employ techniques such as job extension and job rotation. **Job extension** is enlarging jobs by combining several relatively simple jobs to form a job with a wider range of tasks. An example might be combining the jobs of receptionist, typist, and file clerk into jobs containing all three kinds of work. This approach to job enlargement is relatively simple, but if all the tasks are dull, workers will not necessarily be more motivated by the redesigned job.

Job Extension
Enlarging jobs by combining several relatively simple jobs to form a job with a wider range of tasks.

Job rotation does not actually redesign the jobs themselves, but moves employees among several different jobs. This approach to job enlargement is common among production teams. During the course of a week, a team member may carry out each of the jobs handled by the team. Team members might assemble components one day and pack products into cases another day. As with job extension, the enlarged jobs may still consist of repetitious activities, but with greater variation among those activities.

Job Rotation
Enlarging jobs by moving employees among several different jobs.

Job Enrichment The idea of **job enrichment**, or empowering workers by adding more decision-making authority to their jobs, comes from the work of Frederick Herzberg. According to Herzberg's two-factor theory, individuals are motivated more by the intrinsic aspects of work (for example, the meaningfulness of a job) than by extrinsic rewards, such as pay. Herzberg identified five factors he associated with motivating jobs: achievement, recognition, growth, responsibility, and performance of the entire job. Thus, ways to enrich a manufacturing job might include giving employees authority to stop production when quality standards are not being met and having each employee perform several tasks to complete a particular stage of the process, rather than dividing up the tasks among the employees. For a salesperson in a store, job enrichment might involve the authority to resolve customer problems, including the authority to decide whether to issue refunds or replace merchandise.

Job Enrichment
Empowering workers by adding more decision-making authority to jobs.

In practice, however, it is important to note that not every worker responds positively to enriched jobs. These jobs are best suited to workers who are flexible and responsive to others; for these workers, enriched jobs can dramatically improve motivation.[22]

Self-Managing Work Teams Instead of merely enriching individual jobs, some organizations empower employees by designing work to be done by self-managing work teams. As described in Chapter 2, these teams have authority for an entire work process or segment. Team members typically have authority to schedule work, hire team members, resolve problems related to the team's performance, and perform other duties traditionally handled by management. Teamwork can give a job such motivating characteristics as autonomy, skill variety, and task identity.

Because team members' responsibilities are great, their jobs usually are defined broadly and include sharing of work assignments. Team members may, at one time or another, perform every duty of the team. The challenge for the organization is to provide enough training so that the team members can learn the necessary skills. Another approach, when teams are responsible for particular work processes or customers, is to assign the team responsibility for the process or customer, then let the team decide which members will carry out which tasks.

A study of work teams at a large financial services company found that the right job design was associated with effective teamwork.[23] In particular, when teams are self-managed and team members are highly involved in decision making, teams are more productive, employees more satisfied, and managers are more pleased with performance. Teams also tend to do better when each team member performs a variety of tasks and when team members view their effort as significant.

Flexible Work Schedules One way in which an organization can give employees some say in how their work is structured is to offer flexible work schedules. Depending on the requirements of the organization and the individual jobs, organizations may be able to be flexible about when employees work. As introduced in Chapter 2, types of flexibility include flextime and job sharing. Figure 4.6 illustrates alternatives to the traditional 40-hour workweek.

Flextime is a scheduling policy in which full-time employees may choose starting and ending times within guidelines specified by the organization. The flextime policy

Flextime
A scheduling policy in which full-time employees may choose starting and ending times within guidelines specified by the organization.

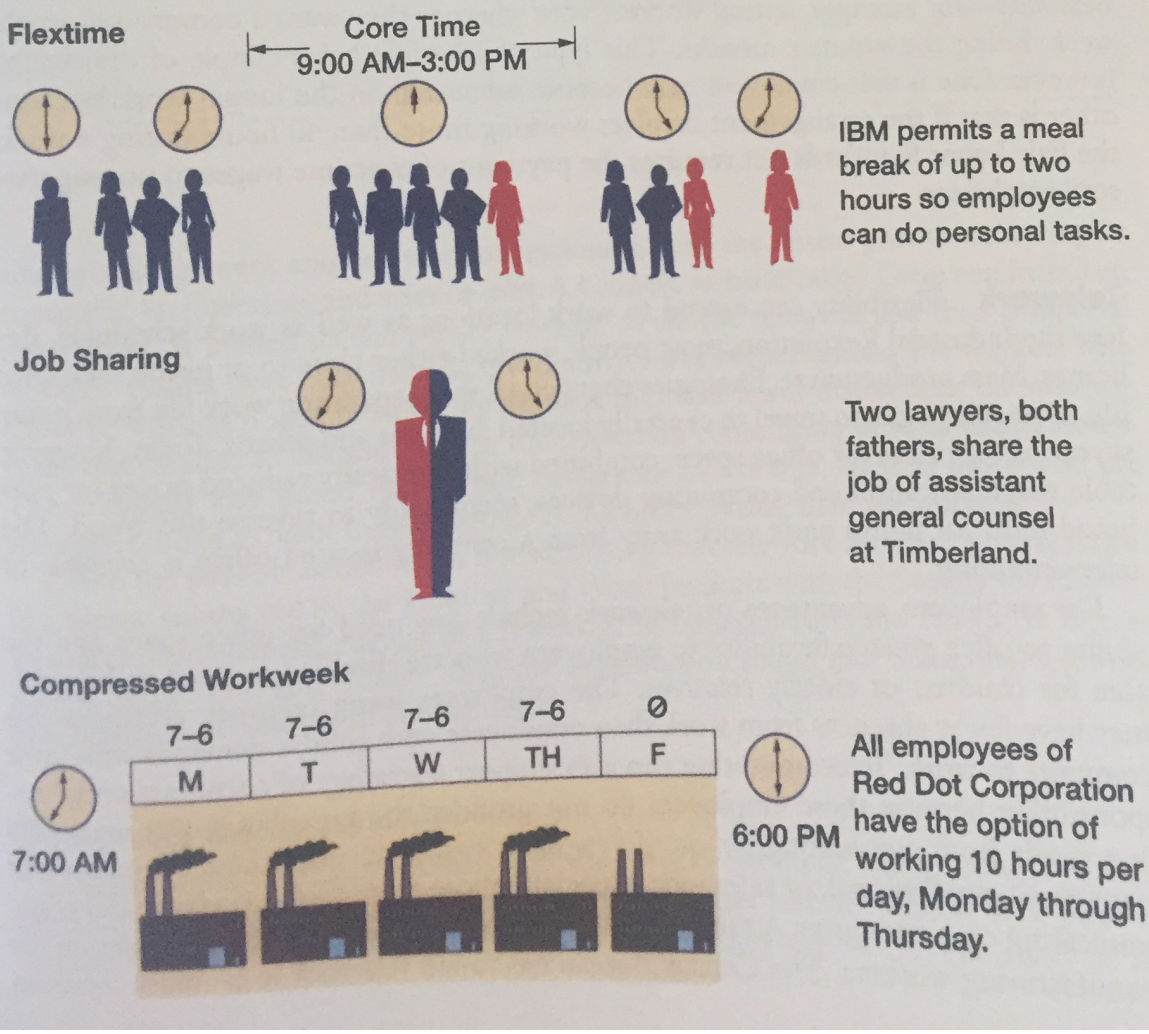


Figure 4.6
Alternatives to the 8-to-5 Job

may require that employees be at work between certain hours, say, 10:00 am and 3:00 pm. Employees work additional hours before or after this period in order to work the full day. One employee might arrive early in the morning in order to leave at 3:00 pm to pick up children after school. Another employee might be a night owl who prefers to arrive at 10:00 am and work until 6:00, 7:00, or even later in the evening. A flextime policy also may enable workers to adjust a particular day's hours in order to make time for doctor's appointments, children's activities, hobbies, or volunteer work. A work schedule that allows time for community and family interests can be extremely motivating for some employees.

Job Sharing
A work option in which two part-time employees carry out the tasks associated with a single job.

Job sharing is a work option in which two part-time employees carry out the tasks associated with a single job. Such arrangements can enable an organization to attract or retain valued employees who want more time to attend school or to care for family members. The job requirements in such an arrangement include the ability to work cooperatively and coordinate the details of one's job with another person.

Although not strictly a form of flexibility for all individual employees, another scheduling alternative is the *compressed workweek*. A compressed workweek is a schedule in which full-time workers complete their weekly hours in fewer than five days. For example, instead of working eight hours a day for five days, the employees could complete 40 hours of work in four 10-hour days. This alternative is most common, but some companies use other alternatives, such as scheduling 80 hours over nine days (with a three-day weekend every other week) or reducing the workweek from 40 to 38 or 36 hours. Employees may appreciate the extra days available for leisure, family, or volunteer activities. An organization might even use this schedule to offer a kind of flexibility—for example, letting workers vote whether they want a compressed workweek during the summer months. This type of schedule has a couple of drawbacks, however. One is that employees may become exhausted on the longer workdays. Another is that if the arrangement involves working more than 40 hours during a week, the Fair Labor Standards Act requires the payment of overtime wages to nonsupervisory employees.

Telework Flexibility can extend to work locations as well as work schedules. Before the Industrial Revolution, most people worked either close to or inside their own homes. Mass production technologies changed all this, separating work life from home life, as people began to travel to centrally located factories and offices. Today, however, skyrocketing prices for office space, combined with drastically reduced prices for portable communication and computing devices, seem ready to reverse this trend. The broad term for doing one's work away from a centrally located office is *telework*, or telecommuting.

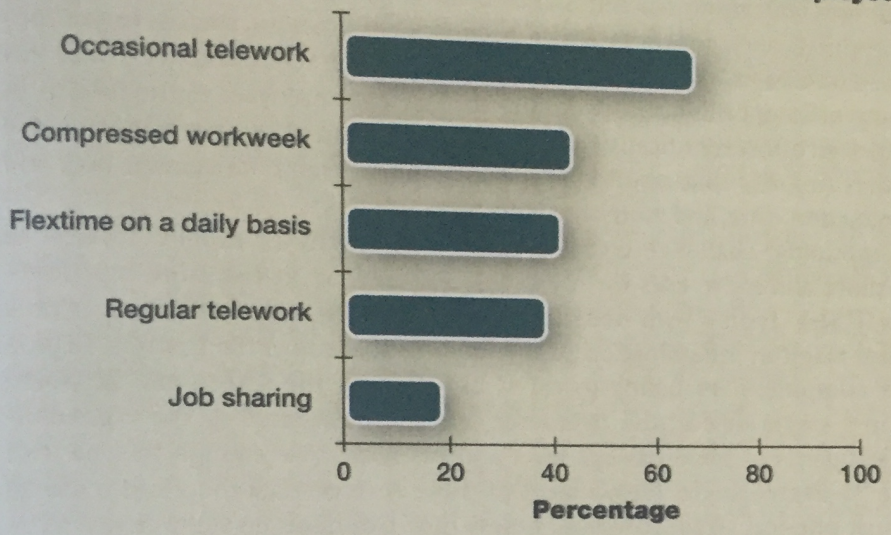
For employers, advantages of telework include less need for office space and the ability to offer greater flexibility to employees who are disabled or need to be available for children or elderly relatives. The employees using telework arrangements may have fewer absences from work than employees with similar demands who must commute to work. Telecommuting can also support a strategy of corporate social responsibility because these employees do not produce the greenhouse gas emissions that result from commuting by car. Telework is easiest to implement for people in managerial, professional, or sales jobs, especially those that involve working and communicating on a computer. A telework arrangement is generally difficult to set up for manufacturing workers. The Census Bureau has found telework to be most common

Did You Know?

Occasional Telework Dominates Flexibility Options

In a survey by the Families and Work Institute and the Society for Human Resource Management, most companies said they provide flexible work arrangements. However, the most common kinds of flexibility are limited—letting employees adjust their quitting time or control when they take breaks. Among the flexible work schedules and places discussed in the chapter, telework on an occasional basis is the most common option.

Flexibility Allowed for at Least Some Employees



Question

What advantages of telework might make it the most widely used form of flexibility?

Sources: Lauren Weber, "Employers Are Getting More Flexible—Up to a Point," *Wall Street Journal,* April 29, 2014, http://blogs.wsj.com; Sarah Halzack, "A Not-So-Flexible Definition of Flexible Work," *Washington Post,* May 1, 2014, http://www.washingtonpost.com; Kenneth Matos and Ellen Galinsky, "2014 National Study of Employers," Families and Work Institute and Society for Human Resource Management, accessed at http://www.whenworkworks.org.

among management and business professionals, with the fastest growth occurring in computer, engineering, and science jobs. A Chinese website called Ctrip conducted an experiment. It invited its call center workers to choose telework and then compared workers' results over nine months. Productivity was higher among the workers who chose to work at home, presumably because they had fewer distractions but also because they tended to use some of the time saved on commuting to work longer hours. The company also noted that certain categories of workers, such as those who are younger, tended to want to be together at the office, rather than teleworking.[24]

Given the possible benefits, it is not surprising that telework has been a rising trend. In a survey conducted by the Families and Work Institute with the Society for Human Resource Management, the use of telework grew between 2008 and 2014.[25] In fact, as shown in the "Did You Know?" box, the organization found that occasional telework is available at two-thirds of companies.

Designing Ergonomic Jobs

LO 4-8 Explain how organizations apply ergonomics to design safe jobs.

The way people use their bodies when they work—whether toting heavy furniture onto a moving van or sitting quietly before a computer screen—affects their physical well-being and may affect how well and how long they can work. The study of the

Ergonomics
The study of the interface between individuals' physiology and the characteristics of the physical work environment.

interface between individuals' physiology and the characteristics of the physical work environment is called **ergonomics**. The goal of ergonomics is to minimize physical strain on the worker by structuring the physical work environment around the way the human body works. Ergonomics therefore focuses on outcomes such as reducing physical fatigue, aches and pains, and health complaints. Ergonomic research includes the context in which work takes place, such as the lighting, space, and hours worked.[26]

Ergonomic job design has been applied in redesigning equipment used in jobs that are physically demanding. Such redesign is often aimed at reducing the physical demands of certain jobs so that anyone can perform them. In addition, many interventions focus on redesigning machines and technology—for instance, adjusting the height of a computer keyboard to minimize occupational illnesses, such as carpal tunnel syndrome. The design of chairs and desks to fit posture requirements is very important in many office jobs. One study found that having employees participate in an ergonomic redesign effort significantly reduced the number and severity of cumulative trauma disorders (injuries that result from performing the same movement over and over), lost production time, and restricted-duty days.[27]

A recent ergonomic challenge comes from the popularity of mobile devices. As workers find more and more uses for these devices, they are at risk from repetitive-stress injuries (RSIs). Typing with one's thumbs to send frequent text messages on a smartphone can result in inflammation of the tendons that move the thumbs. Laptop and notebook computers are handy to carry, but because the screen and keyboard are attached in a single device, the computer can't be positioned to the ergonomically correct standards of screen at eye level and keyboard low enough to type with arms bent at a 90-degree angle. Heavy users of these devices must therefore trade off eyestrain against physical strain to wrists, unless they can hook up their device to an extra, properly positioned keyboard or monitor. Touchscreens pose their own risks. They are typically part of a flat device such as a smartphone or tablet computer, and these are difficult to position for optimal viewing and typing. Using vertically oriented touchscreens causes even more muscle strain than tapping on a screen lying flat. In addition, because touchscreens usually lack the tactile feedback of pressing keys on a keyboard, users tend to strike them with more force than they use on real keys. Attaching a supplemental keyboard addresses this potential source of strain. When using mobile devices or any computer, workers can protect themselves by taking frequent breaks and paying attention to their posture while they work.[28]

The Occupational Safety and Health Administration has a "four-pronged" strategy for encouraging ergonomic job design. The first prong is to issue guidelines (rather than regulations) for specific industries. As of 2012, these guidelines have been issued for the nursing home, grocery store, and poultry-processing industries, and shipyards. Second, OSHA enforces violations of its requirement that employers have a general duty to protect workers from hazards, including ergonomic hazards. Third, OSHA works with industry groups to advise employers in those industries. And finally, OSHA established a National Advisory Committee on Ergonomics to define needs for further research. You can learn more about OSHA's guidelines at the agency's website, **www.osha.gov**.

LO 4-9 Discuss how organizations can plan for the mental demands of a job.

Designing Jobs That Meet Mental Capabilities and Limitations

Just as the human body has capabilities and limitations, addressed by ergonomics, the mind, too, has capabilities and limitations. Besides hiring people with certain

mental skills, organizations can design jobs so that they can be accurately and safely performed given the way the brain processes information. Generally, this means reducing the information-processing requirements of a job. In these simpler jobs, workers may be less likely to make mistakes or have accidents. Of course, the simpler jobs also may be less motivating. Research has found that challenging jobs tend to fatigue and dissatisfy workers when they feel little control over their situation, lack social support, and feel motivated mainly to avoid errors. In contrast, they may enjoy the challenges of a difficult job where they have some control and social support, especially if they enjoy learning and are unafraid of making mistakes.[29] Because of this drawback to simplifying jobs, it can be most beneficial to simplify jobs where employees will most appreciate having the mental demands reduced (as in a job that is extremely challenging) or where the costs of errors are severe (as in the job of a surgeon or air-traffic controller).

Technological advances can sometimes increase job demands. Some employees may be required to juggle information from several sources at once, which may distract them from their primary job task.

There are several ways to simplify a job's mental demands. One is to limit the amount of information and memorization that the job requires. Organizations can also provide adequate lighting, easy-to-understand gauges and displays, simple-to-operate equipment, and clear instructions. For project management, teamwork, and work done by employees in different locations, organizations may provide software that helps with tracking progress. Often, employees try to simplify some of the mental demands of their own jobs by creating checklists, charts, or other aids. Finally, every job requires some degree of thinking, remembering, and paying attention, so for every job, organizations need to evaluate whether their employees can handle the job's mental demands.

Changes in technology sometimes reduce job demands and errors, but in some cases, technology has made the problem worse. Some employees try to juggle information from several sources at once—say, talking on a cell phone while typing, surfing the web for information during a team member's business presentation, or repeatedly stopping work on a project to check e-mail or Twitter feeds. In these cases, the cell phone, handheld computer, and e-mail or tweets are distracting the employees from their primary task. They may convey important information, but they also break the employee's train of thought, reducing performance and increasing the likelihood of errors. Research by a firm called Basex, which specializes in the knowledge economy, found that a big part of the information overload problem is recovery time, that is, the time it takes a person's thinking to switch back from an interruption to the task at hand. The Basex researchers found that recovery time is from 10 to 20 times the length of the interruption. For example, after a 30-second pause to check a Twitter feed, the recovery time could be five minutes or longer.[30]

Organizations probably can't design interruption-free jobs, and few employees would want to isolate themselves entirely from the information and relationships available online. But employers can design jobs that empower workers to manage their time—for example, allowing them to schedule blocks of time when they concentrate on work and do not answer phone calls, e-mails, or text messages. Some employees set aside one or two periods during the day when they will open their e-mail programs, read messages, and respond to the messages immediately. As a vice president at United