An optimist says, “The glass is half full.” A pessimist says, “It’s half empty.” A reengineering consultant says, “Looks like you’ve got twice as much glass as you need.”

—Anonymous
After studying this chapter, you should be able to

1. Explain the job characteristics model
2. Contrast the social information processing model to the job characteristics model
3. Describe the role of the PDCA cycle in continuous improvement
4. Explain the current popularity of reengineering
5. Contrast reengineering and TQM
6. Describe the implications of flexible manufacturing systems on people who work within them
7. Identify who is affected by worker obsolescence
8. Explain the influence of work space design on employee behavior
9. Describe how a job can be enriched
10. Contrast the benefits and drawbacks to telecommuting from the employee’s point of view
The Melrose Park, Illinois headquarters of package manufacturer AGI Inc. doesn’t look like your traditional workplace.¹ There is no labyrinth of hallways, closed offices, or traditional barriers that mark and define individual employees’ territories. Instead, AGI’s employees work in an open environment. AGI’s management has spent more than $1 million redesigning the company’s work space in order to eliminate structural connotations of hierarchies and to foster collaboration. Out went most of the walls, doors, and private offices, to be replaced with a relatively barrier-free environment.

The new offices are in a square with an oval track in the middle. Outside the oval is open space filled with modular office furniture. There are no walls, and the area is flooded with sunlight from skylights. Inside the oval’s perimeter are executive offices with glass walls and no doors. And in the very center is a set of conference rooms where groups can meet and where tasks requiring privacy can be held. To further facilitate collaboration, no matter where employees are—at a co-worker’s desk or on the plant floor—they have access to their computer files from the 32 computer terminals on the premises. Those employees who use laptops can plug into the company’s network at any of 250 data ports.
AGI’s CEO, Richard Block, planned the redesigned work space to encourage more participative problem solving and teamwork. He says it’s working. Employees interact more often because there are fewer physical barriers. And the open workplace has encouraged the creation of ad hoc teams. For instance, when AGI’s Atlanta account executive learned during a visit to headquarters that a client was disappointed with the color quality of a package, he brought his PowerBook down to film production and quickly assembled the production planner, printing supervisor, and a finishing supervisor. Then he called up his client file, including all correspondence, so he could compare the client’s requests with AGI’s production specifications. Once the group members solved the problem, they called the client for final approval.

Employees seem to like the open work space. By tearing down the physical barriers between workers and providing them with the information technology to work wherever necessary, employees find they can be more productive. And while some executives complained at first about the lack of privacy, they all now embrace the open environment. They have come to see how it makes their jobs easier. ☘
AGI is among a growing number of companies that are redesigning their work spaces in order to improve collaboration and communication. In this chapter, we discuss work space design in detail and explain how an employee's physical environment and work space layout can affect his or her work behavior. We also present several frameworks for analyzing jobs, demonstrate how technology is changing organizations and the jobs that people do, and conclude by showing how management can redesign jobs and work schedules in ways that can increase employee productivity and satisfaction.

**Conceptual Frameworks for Analyzing Work Tasks**

“Every day was the same thing,” Frank Greer began. “Put the right passenger seat into Jeeps as they came down the assembly line, pop in four bolts locking the seat frame to the car body, then tighten the bolts with my electric wrench. Thirty cars and 120 bolts an hour, eight hours a day. I didn’t care that they were paying me $18 an hour, I was going crazy. I did it for almost a year and a half. Finally, I just said to my wife that this isn’t going to be the way I’m going to spend the rest of my life. My brain was turning to Jell-O on that job. So I quit. Now I work in a print shop and I make less than $12 an
hour. But let me tell you, the work I do is really interesting. It challenges me! I look forward every morning to going to work again.”

Frank Greer is acknowledging two facts we all know: (1) jobs are different and (2) some are more interesting and challenging than others. These facts have not gone unnoticed by OB researchers. They have responded by developing a number of task characteristics theories that seek to identify task characteristics of jobs, how these characteristics are combined to form different jobs, and the relationship of these task characteristics to employee motivation, satisfaction, and performance.

There are at least seven different task characteristics theories. Fortunately, there is a significant amount of overlap between them. For instance, Herzberg’s motivation-hygiene theory and the research on the achievement need (both discussed in Chapter 5) are essentially task characteristics theories. You’ll remember that Herzberg argued that jobs that provided opportunities for achievement, recognition, responsibility, and the like would increase employee satisfaction. Similarly, McClelland demonstrated that high achievers performed best in jobs that offered personal responsibility, feedback, and moderate risks.

In this section, we review the three most important task characteristics theories—requisite task attributes theory, the job characteristics model, and the social information processing model.
Requisite Task Attributes Theory

The task characteristics approach began with the pioneering work of Turner and Lawrence in the mid-1960s. They developed a research study to assess the effect of different kinds of jobs on employee satisfaction and absenteeism. They predicted that employees would prefer jobs that were complex and challenging; that is, such jobs would increase satisfaction and result in lower absence rates. They defined job complexity in terms of six task characteristics: (1) variety; (2) autonomy; (3) responsibility; (4) knowledge and skill; (5) required social interaction; and (6) optional social interaction. The higher a job scored on these characteristics, according to Turner and Lawrence, the more complex it was.

Their findings confirmed their absenteeism prediction. Employees in high-complexity tasks had better attendance records. But they found no general correlation between task complexity and satisfaction—until they broke their data down by the background of employees. When individual differences in the form of urban-versus-rural background were taken into account, employees from urban settings were shown to be more satisfied with low-complexity jobs. Employees with rural backgrounds reported higher satisfaction in high-complexity jobs. Turner and Lawrence concluded that workers in larger communities had a variety of nonwork interests and thus were less involved and motivated by their work. In
contrast, workers from smaller towns had fewer nonwork interests and were more receptive to the complex tasks of their jobs.

Turner and Lawrence’s requisite task attributes theory was important for at least three reasons. First, they demonstrated that employees did respond differently to different types of jobs. Second, they provided a preliminary set of task attributes by which jobs could be assessed. And third, they focused attention on the need to consider the influence of individual differences on employees’ reaction to jobs.

The Job Characteristics Model

Turner and Lawrence’s requisite task attributes theory laid the foundation for what is today the dominant framework for defining task characteristics and understanding their relationship to employee motivation, performance, and satisfaction. That is Hackman and Oldham’s job characteristics model (JCM).5

According to the JCM, any job can be described in terms of five core job dimensions, defined as follows:

1. **Skill variety**: The degree to which the job requires a variety of different activities so the worker can use a number of different skills and talent

2. **Task identity**: The degree to which the job requires completion of a whole and identifiable piece of work

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The Job Characteristics Model

Job characteristics model
Identifies five job characteristics and their relationship to personal and work outcomes.

**Skill variety**
The degree to which the job requires a variety of different activities.

**Task identity**
The degree to which the job requires completion of a whole and identifiable piece of work.
3. **Task significance**: The degree to which the job has a substantial impact on the lives or work of other people.

4. **Autonomy**: The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out.

5. **Feedback**: The degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his or her performance.

Exhibit 14-1 offers examples of job activities that rate high and low for each characteristic.

Exhibit 14-2 presents the model. Notice how the first three dimensions—skill variety, task identity, and task significance—combine to create meaningful work. That is, if these three characteristics exist in a job, we can predict that the incumbent will view the job as being important, valuable, and worthwhile. Notice, too, that jobs that possess autonomy give job incumbents a feeling of personal responsibility for the results and that, if a job provides feedback, employees will know how effectively they are performing. From a motivational standpoint, the model says that internal rewards are obtained by individuals when they learn (knowledge of results) that they personally (experienced responsibility) have performed well on a task that they care about (experienced meaning-
<table>
<thead>
<tr>
<th><strong>Skill Variety</strong></th>
<th>High variety</th>
<th>The owner-operator of a garage who does electrical repair, rebuilds engines, does body work, and interacts with customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low variety</td>
<td>A body shop worker who sprays paint eight hours a day</td>
<td></td>
</tr>
<tr>
<td><strong>Task Identity</strong></td>
<td>High identity</td>
<td>A cabinet maker who designs a piece of furniture, selects the wood, builds the object, and finishes it to perfection</td>
</tr>
<tr>
<td>Low identity</td>
<td>A worker in a furniture factory who operates a lathe solely to make table legs</td>
<td></td>
</tr>
<tr>
<td><strong>Task Significance</strong></td>
<td>High significance</td>
<td>Nursing the sick in a hospital intensive care unit</td>
</tr>
<tr>
<td>Low significance</td>
<td>Sweeping hospital floors</td>
<td></td>
</tr>
<tr>
<td><strong>Autonomy</strong></td>
<td>High autonomy</td>
<td>A telephone installer who schedules his or her own work for the day, makes visits without supervision, and decides on the most effective techniques for a particular installation</td>
</tr>
<tr>
<td>Low autonomy</td>
<td>A telephone operator who must handle calls as they come according to a routine, highly specified procedure</td>
<td></td>
</tr>
</tbody>
</table>
The more that these three psychological states are present, the greater will be employees' motivation, performance, and satisfaction, and the lower their absenteeism and likelihood of leaving the organization. As Exhibit 14-2 shows, the links between the job dimensions and the outcomes are moderated or adjusted by the strength of the individual's growth need, that is, by the employee's desire for self-esteem and self-actualization. This means that individuals with a high growth need are more likely to experience the psychological states when their jobs are enriched than are their counterparts with a low growth need. Moreover, they will respond more positively to the psychological states when they are present than will individuals with a low growth need.


Feedback

High feedback: An electronics factory worker who assembles a radio and then tests it to determine if it operates properly.

Low feedback: An electronics factory worker who assembles a radio and then routes it to a quality control inspector who tests it for proper operation and makes needed adjustments.

Exhibit 14-2
The Job Characteristics Model

- Core job dimensions
  - Skill variety
  - Task identity
  - Task significance
- Critical psychological states
  - Experienced meaningfulness of the work
- Personal and work outcomes
  - High internal work motivation
  - High-quality work performance
  - High satisfaction with the work
  - Low absenteeism and turnover
- Employee growth-need strength

The core dimensions can be combined into a single predictive index, called the **motivating potential score** (MPS). Its computation is shown in Exhibit 14-3.

Jobs that are high on motivating potential must be high on at least one of the three factors that lead to experienced meaningfulness, and they must be high on both autonomy and feedback. If jobs score high on motivating potential, the model predicts that motivation, performance, and satisfaction will be positively affected, while the likelihood of absence and turnover will be lessened.

### Exhibit 14-3
**Computing a Motivating Potential Score**

\[
\text{Motivating Potential Score (MPS)} = \frac{\text{Skill variety} + \text{Task identity} + \text{Task significance}}{3} \times \text{Autonomy} \times \text{Feedback}
\]
The job characteristics model has been well researched. Most of the evidence supports the general framework of the theory—that is, there is a multiple set of job characteristics and these characteristics impact behavioral outcomes. But there is still considerable debate around the five specific core dimensions in the JCM, the multiplicative properties of the MPS, and the validity of growth-need strength as a moderating variable.

There is some question as to whether or not task identity adds to the model’s predictive ability, and there is evidence suggesting that skill variety may be redundant with autonomy. Furthermore, a number of studies have found that by adding all the variables in the MPS, rather than adding some and multiplying by others, the MPS becomes a better predictor of work outcomes. Finally, the strength of an individual’s growth needs as a meaningful moderating variable has recently been called into question. Other variables, such as the presence or absence of social cues, perceived equity with comparison groups, and propensity to assimilate work experience, may be more valid in moderating the job characteristics–outcome relationship. Given the current state of research on moderating variables, one should be cautious in unequivocally accepting growth-need strength as originally included in the JCM.

Where does this leave us? Given the current state of evidence, we can make the following statements with relative confidence: (1) People who work on jobs with high-core job dimensions are gener-
ally more motivated, satisfied, and productive than are those who do not. (2) Job dimensions operate through the psychological states in influencing personal and work outcome variables rather than influencing them directly.\(^\text{13}\)

**Social Information Processing Model**

At the beginning of this section on task characteristics theories, do you remember Frank Greer complaining about his former job on the Jeep assembly line? Would it surprise you to know that one of Frank’s best friends, Russ Wright, is still working at Jeep, doing the same job that Frank did, and that Russ thinks his job is perfectly fine? Probably not! Why? Because, consistent with our discussion of perception in Chapter 3, we recognize that people can look at the same job and evaluate it differently. The fact that people respond to their jobs as they perceive them rather than to the objective jobs themselves is the central thesis in our third task characteristics theory. It’s called the **social information processing (SIP) model**.\(^\text{14}\)

The SIP model argues that employees adopt attitudes and behaviors in response to the social cues provided by others with whom they have contact. These others can be co-workers, supervisors, friends, family members, or customers. For instance, Gary Ling got a summer job working in a British Columbia sawmill. Since jobs...
were scarce and this one paid particularly well, Gary arrived on his first day of work highly motivated. Two weeks later, however, his motivation was quite low. What happened was that his co-workers consistently bad-mouthed their jobs. They said the work was boring, that having to clock in and out proved management didn’t trust them, and that supervisors never listened to their opinions. The objective characteristics of Gary’s job had not changed in the two-week period; rather, Gary had reconstructed reality based on messages he had received from others.

A number of studies generally confirm the validity of the SIP model. For instance, it has been shown that employee motivation and satisfaction can be manipulated by such subtle actions as a co-worker or boss commenting on the existence or absence of job features like difficulty, challenge, and autonomy. So managers should give as much (or more) attention to employees’ perceptions of their jobs as to the actual characteristics of those jobs. They might spend more time telling employees how interesting and important their jobs are. And managers should also not be surprised that newly hired employees and people transferred or promoted to a new position are more likely to be receptive to social information than are those with greater seniority.
We introduced the term *technology* in the previous chapter’s discussion of why structures differ. We said it was how an organization transfers its inputs into outputs. In recent years, the term has become widely used by economists, managers, consultants, and business analysts to describe machinery and equipment that utilizes sophisticated electronics and computers to produce those outputs.

The common theme among new technologies in the workplace is that they substitute machinery for human labor in transforming inputs into outputs. This substitution of capital for labor has been going on essentially nonstop since the industrial revolution began in the mid-1800s. For instance, the introduction of electricity allowed textile factories to introduce mechanical looms that could produce cloth far faster and more cheaply than was previously possible when the looms were powered by individuals. But it’s been the computer-ization of equipment and machinery in the last quarter-century that has been the prime mover in reshaping the twentieth-century workplace. Automated teller machines, for example, have replaced tens of thousands of human tellers in banks. Ninety-eight percent of the spot welds on new Ford Tauruses are performed by robots, not people. Many cars now come equipped with on-board computers that diagnose problems in seconds that used to take hours for mechanics to diagnose. IBM has built a plant in Austin, Texas, that can produce
laptop computers without the help of a single worker. Everything from the time parts arrive at the IBM plant to the final packing of finished products is completely automated. And an increasing number of companies, small and large alike, are turning to multimedia and interactive technology for employee training.

This book is concerned with the behavior of people at work. No coverage of this topic today would be complete without discussing how recent advances in technology are changing the workplace and

Luxury car maker Lexus, a division of Toyota Motor Sales, has turned to technology for training its salespeople. Computerized simulation exercises help salespeople develop their interpersonal skills through buyer/seller role-playing simulations. Trainees learn how to conduct honest negotiations with buyers, how to treat customers with respect and courtesy, and how to tailor a presentation to a customer’s specific interest, as shown in this photo. The company’s Fact Lab provides product information about Lexus and competing models, equipping salespeople with the knowledge necessary to achieve the Lexus goal of “complete customer satisfaction.”
affecting the work lives of employees. In this section, we’ll look at four specific issues related to technology and work. These are TQM and continuous improvement processes, reengineering, flexible manufacturing systems, and worker obsolescence.

Continuous Improvement Processes

In Chapter 1, we described total quality management (TQM) as a philosophy of management that’s driven by the constant attainment of customer satisfaction through the continuous improvement of all organizational processes. Managers in many organizations, especially in North America, have been criticized for accepting a level of performance that is below perfection. TQM, however, argues that good isn’t good enough! To dramatize this point, it’s easy to assume that 99.9 percent error-free performance represents the highest standards of excellence. Yet it doesn’t look so impressive when you recognize that this standard would result in the U.S. Post Office losing 2,000 pieces of mail per hour, or U.S. doctors performing 500 incorrect surgical operations per week, or two plane crashes per day at O’Hare Airport in Chicago!16

TQM programs seek to achieve continuous process improvements so that variability is constantly reduced. When you eliminate variations, you increase the uniformity of the product or service. This, in turn, results in lower costs and higher quality. For instance,
Advanced Filtration Systems Inc., of Champaign, Illinois, recently cut the number of product defects—as determined by a customer quality audit—from 26.5 per 1,000 units to zero over four years. And that occurred during a period when monthly unit production tripled and the number of workers declined by 20 percent.

Continuous improvement runs counter to the more historical American management approach of seeing work projects as being linear—with a beginning and an end. For example, American managers traditionally looked at cost cutting as a short-term project. They set a goal of cutting costs by 20 percent, achieved it, and then said: “Whew! Our cost cutting is over.” The Japanese, on the other hand, have regarded cost control as something that never ends. The search for continual improvement creates a race without a finish line.

The search for never-ending improvement requires a circular approach rather than a linear one. This is illustrated in the Plan-Do-Check-Act (PDCA) cycle shown in Exhibit 14-5. Management plans a change, does it, checks the results and, depending on the outcome, acts to standardize the change or begin the cycle of improvement again with new information. This cycle treats all organizational processes as being in a constant state of improvement.

Eaton Corporation, a major manufacturer of automobile components, has adopted the PDCA cycle throughout the company. Management encourages its workers to take thousands of small steps to incrementally improve the products they make and the processes
used to make them. This extends to office workers who haggle over utility rates, challenge local tax assessments, scrutinize inventories, and eliminate paperwork. Continuous improvement helped Eaton increase its annual productivity between 1983 and 1992 by 3 percent a year compared to the U.S. average of 1.9 percent.

As literally tens of thousands of organizations introduce TQM and continuous process improvement, what does it mean for employees and their jobs? It means they’re no longer able to rest on their previous accomplishments and successes. So, for some people,
they may experience increased stress from a work climate that no longer accepts complacency with the status quo. A race with no finish line means a race that’s never over, which creates constant tension. While this tension may be positive for the organization (remember functional conflict from Chapter 12), the pressures from an unrelenting search for process improvements can create anxiety and stress in some employees. Probably the most significant implication for employees is that management will look to them as the prime source for improvement ideas. Employee involvement programs, therefore, are part and parcel of TQM. Empowered work teams who have hands-on involvement in process improvement, for instance, are widely used in those organizations that have introduced TQM.

**Reengineering Work Processes**

We also introduced reengineering in Chapter 1. We described it as considering how things would be done if you could start all over from scratch.

The term *reengineering* comes from the historical process of taking apart an electronics product and designing a better version. Michael Hammer coined the term for organizations. When he found companies using computers simply to automate outdated processes, rather than finding fundamentally better ways of doing
things, he realized the same principles could be applied to business. So, as applied to organizations, reengineering means management should start with a clean sheet of paper—rethinking and redesigning those processes by which the organization creates value and does work, ridding itself of operations that have become antiquated in the computer age.¹⁹

**KEY ELEMENTS** Three key elements of reengineering are identifying an organization’s distinctive competencies, assessing core processes, and reorganizing horizontally by process.

An organization’s **distinctive competencies** define what it is that the organization is more superior at delivering than its competition. Examples might include superior store locations, a more efficient distribution system, higher-quality products, more knowledgeable sales personnel, or superior technical support. Dell Computer, for instance, differentiates itself from its competitors by emphasizing high-quality hardware, comprehensive service and technical support, and low prices. Why is identifying distinctive competencies so important? Because it guides decisions regarding what activities are crucial to the organization’s success.

Management also needs to assess the core processes that clearly add value to the organization’s distinctive competencies. These are the processes that transform materials, capital, information, and labor into products and services that the customer values.
the organization is viewed as a series of processes, ranging from strategic planning to after-sales customer support, management can determine to what degree each adds value. Not surprisingly, this process value analysis typically uncovers a whole lot of activities that add little or nothing of value and whose only justification is “we’ve always done it this way.”

Reengineering requires management to reorganize around horizontal processes. This means cross-functional and self-managed teams. It means focusing on processes rather than functions. So, for instance, the vice president/marketing might become the “process owner of finding and keeping customers.” And it also means cutting out levels of middle management. As Hammer pointed out, “Managers are not value-added. A customer never buys a product because of the caliber of management. Management is, by definition, indirect. So if possible, less is better. One of the goals of reengineering is to minimize the necessary amount of management.”

WHY REENGINEERING NOW? Isn’t reengineering something management should have been doing all along? Why has it become such a hot topic in the 1990s? The answers, according to Michael Hammer, are a changing global environment and organizational structures that had gotten top heavy.22

Traditional mechanistic organizations worked fine in times of stable growth. Activities could be fragmented and specialized to gain
economic efficiencies. This described the environment faced by most North American organizations in the 1950s, 1960s, and much of the 1970s. But most organizations today operate in global conditions of overcapacity. Customers are much more informed and sophisticated than they were 30 years ago. Moreover, markets, production, and capital are all globally mobile. Investors in Australia, for example, can put their money into opportunities in Japan, Canada, or anywhere else in the world if they see better returns than they can get at home. Global customers now demand quality, service, and low cost. If you can’t provide it, they’ll get it from someone else.

Work specialization, functional departments, narrow spans of control, and the like drove down direct labor costs but the bureaucracies they created had massive overhead costs. That is, to coordinate all the fragmentation and specialization, the organization had to create numerous levels of middle management to glue together the fragmented pieces. So while bureaucracies drove down costs at the operating level, they required increasingly expensive coordinating systems. Those organizations that introduced teams, decentralized decisions, widened spans of control, and flattened structures became more efficient and challenged the traditional ways of doing things.

**REENGINEERING VS. TQM** Is reengineering just a another term for TQM? No! They do have some common characteristics. They both, for instance, emphasize processes and satisfying the customer.
After that, they diverge radically. This is evident in their goals and the means they use for achieving their goals.

TQM seeks incremental improvements, while reengineering looks for quantum leaps in performance. That is, the former is essentially about improving something that is basically okay; the latter is about taking something that is irrelevant, throwing it out, and starting over. And the means the two approaches use are totally different. TQM relies on bottom-up, participative decision making in both the planning of a TQM program and its execution. Reengineering, on the other hand, is initially driven by top management. When reengineering is complete, the workplace is largely self-managed. But getting there is a very autocratic, non-democratic process. Reengineering’s supporters argue that it has to be this way because the level of change that the process demands is highly threatening to people and they aren’t likely to accept it voluntarily. When top management commits to reengineering, employees have no choice. As Hammer is fond of saying, “you either get on the train, or we’ll run over you with the train.”24 Of course, autocratically imposed change is likely to face employee resistance. While there is no easy solution to the resistance that top-down change creates, some of the techniques presented in Chapter 17 in our discussion of overcoming resistance to change can be helpful.
IMPLICATIONS FOR EMPLOYEES  Reengineering is rapidly gaining momentum in business and industry. A recent survey found that, among manufacturing firms, 44 percent of respondents indicated they are now reengineering or considering doing so. Among utilities and insurance companies, the responses were 48 and 52 percent, respectively.

Some of the companies that have implemented reengineering in at least some of their divisions include Motorola, Xerox, Ford, Banc One, Banca di America e di Italia, AT&T, Siemens, KPMG Peat Marwick, Hallmark, and the Commonwealth life insurance group. Hallmark, for instance, cut the time it takes to get a new product to market down from two years to a few months. And Commonwealth now has 1,100 people doing the work that 1,900 used to do, even though its business has risen 25 percent.

Reengineering's popularity isn’t surprising. In today's highly competitive global marketplace, companies are finding that they’re forced to reengineer their work processes if they’re going to survive. And employees will “have to get on the train.”

Lots of people are going to lose their jobs as a direct result of reengineering efforts. Just how many depends on the pace at which organizations adopt the new techniques. Some experts say that reengineering will eliminate from 1 million to 2.5 million jobs each year for the foreseeable future. Undoubtedly much of the downsizing movement can be directly traced to reengineering efforts. But
regardless of the number, the impact won’t be uniform across the organization. Staff support jobs, especially middle managers, will be most vulnerable. So, too, will clerical jobs in service industries. For instance, one knowledgeable observer predicts that reengineering will reduce employment in commercial banks and thrift institutions by 30 to 40 percent during the 1990s.\(^{29}\)

Those employees that keep their jobs after reengineering will find that they aren’t the same jobs any longer. These new jobs will typically require a wider range of skills, include more interaction with customers and suppliers, offer greater challenge, contain increased responsibilities, and provide higher pay. However, the three to five-year period it takes to implement reengineering is usually tough on employees. They suffer from uncertainty and anxiety associated with taking on new tasks and having to discard long-established work practices and formal social networks.

**Flexible Manufacturing Systems**

They look like something out of a science-fiction movie in which remote-controlled carts deliver a basic casting to a computerized machining center. With robots positioning and repositioning the casting, the machining center calls upon its hundreds of tools to perform varying operations that turn the casting into a finished
part. Completed parts, each a bit different from the others, are finished at a rate of one every 90 seconds. Neither skilled machinists nor conventional machine tools are used. Nor are there any costly delays for changing dies or tools in this factory. A single machine can make dozens or even hundreds of different parts in any order management wants. Welcome to the world of **flexible manufacturing systems**.30

In a global economy, those manufacturing organizations that can respond rapidly to change have a competitive advantage. They can, for instance, better meet the diverse needs of customers and deliver products faster than their competitors. When customers were willing to accept standardized products, fixed assembly lines made sense. But nowadays, flexible technologies are increasingly necessary to compete effectively.

The unique characteristic of flexible manufacturing systems is that by integrating computer-aided design, engineering, and manufacturing, they can produce low-volume products for customers at a cost comparable to what had been previously possible only through mass production. Flexible manufacturing systems are, in effect, repealing the laws of economies of scale. Management no longer has to mass-produce thousands of identical products to achieve low per-unit production costs. With flexible manufacturing, when management wants to produce a new part, it doesn’t change machines—it just changes the computer program.

**flexible manufacturing system**
Integration of computer-aided design, engineering, and manufacturing to produce low-volume products at mass-production costs.
Some automated plants can build a wide variety of flawless products and switch from one product to another on cue from a central computer. John Deere, for instance, has a $1.5 billion automated factory that can turn out ten basic tractor models with as many as 3,000 options without plant shutdowns for retooling. National Bicycle Industrial Co., which sells its bikes under the Panasonic brand, uses flexible manufacturing to produce any of 11,231,862 variations on...

A flexible manufacturing system at IBM’s plant in Charlotte, North Carolina, can produce 27 different computer products at the same time. The automated assembly lines are controlled by computer instructions that vary based on diverse customer needs. The computers also give employees assembly instructions. This flexible system brings efficiency to IBM’s manufacturing process and helps the company deliver products to customers more quickly than competitors.
18 models of racing, road, and mountain bikes in 199 color patterns and an almost unlimited number of sizes. This allows Panasonic to provide almost customized bikes at mass-produced prices.\textsuperscript{31}

What do flexible manufacturing systems mean for people who have to work within them? They require a different breed of industrial employee.\textsuperscript{32} Workers in flexible manufacturing plants need more training and higher skills. This is because there are fewer employees, so each has to be able to do a greater variety of tasks. For instance, at a flexible Carrier plant in Arkansas, which makes compressors for air conditioners, all employees undergo six weeks of training before they start their jobs. This training includes learning to read blueprints, math such as fractions and metric calculations, statistical process-control methods, some computer skills, and solving the problems involved in dealing with fellow workers. In addition to higher skills, employees in flexible plants are typically organized into teams and given considerable decision-making discretion. Consistent with the objective of high flexibility, these plants tend to have organic structures. They decentralize authority into the hands of the operating teams.

Worker Obsolescence

Changes in technology have cut the shelf life of most employees’ skills. A factory worker or clerical employee in the 1950s could learn one job and be reasonably sure that his or her skills would be ade-
quate to do that job for most of his or her work life. That certainly is no longer true. New technologies driven by computers, reengineering, TQM, and flexible manufacturing systems are changing the demands of jobs and the skills employees need to do them.

Repetitive tasks like those traditionally performed on assembly lines and by low-skilled office clerks will continue to be automated. And a good number of jobs will be upgraded. For instance, as most managers and professionals take on the task of writing their own memos and reports using word processing software, the traditional secretary’s job will be upgraded to become more of an administrative assistant. Those secretaries that aren’t equipped to take on these expanded roles will be displaced.

Reengineering, as we previously noted, is producing significant increases in employee productivity. The redesign of work processes is achieving higher output with fewer workers. And these reengineered jobs require different skills. Employees who are computer illiterate, have poor interpersonal skills, or can’t work autonomously will increasingly find themselves ill prepared for the demands of new technologies.

Keep in mind that the obsolescence phenomenon doesn’t exclude managers. Those middle managers who merely acted as conduits in the chain of command between top management and the operating floor are being eliminated. And new skills—for exam-
ple, coaching, negotiating, and building teams—are becoming absolute necessities for every manager.

Finally, software is changing the jobs of many professionals, including lawyers, doctors, accountants, financial planners, and librarians.33 Software programs will allow laypeople to use specialized knowledge to solve routine problems themselves or opt for a software-armed paraprofessional. Particularly vulnerable are those professionals who do standardized jobs. A lot of legal work, for instance, consists of writing standard contracts and other routine activities. These tasks will be done inside law firms by computers and paralegals; they might even be done by clients themselves, using software designed to prepare wills, trusts, incorporations, and partnerships. Software packages, such as TurboTax, will continue to take a lot of work away from professional accountants. And hospitals are using software to help doctors make their diagnoses. Punch in a patient’s age, sex, lab results, and symptoms; answer a set of structured questions; and a $995 program called Illiad will draw on its knowledge of nine subspecialties of internal medicine to diagnose the patient’s problem. These examples demonstrate that even the knowledge of highly trained professionals can become obsolete. As the world changes, professionals will also need to change if they’re to survive.
Physical Working Conditions and Work Space Design

Did you ever try to study for an exam in a library when the temperature was uncomfortably high? Or have you tried studying at home while family or friends talked loudly in an adjacent room? Did you find it hard to concentrate? If so, then you understand how employees might similarly be affected by their physical work setting.

Architects, industrial engineers, and office designers have known for decades that factors like temperature, noise level, and the physical layout of the work space influence an employee’s performance. But it’s only been in the past couple of decades that OB researchers have come to the same conclusion. The following briefly summarizes the research evidence linking the physical environment and work space design to employee performance and satisfaction.34

Physical Environment

At the turn of the century, “sweat shops” were common. Employees regularly toiled under adverse conditions such as extreme temperatures, poor lighting, polluted air, or cramped work spaces. Few employees in developed countries face such conditions today. We tend to take for granted that organizations will provide their employees with safe, healthy, and comfortable physical workplaces. Yet envi-
Environmental conditions vary considerably from office to office and from factory to factory. Moreover, the evidence indicates that even relatively modest variations in temperature, noise, lighting, or air quality can exert appreciable effects on employee performance and attitudes. As you review the evidence, keep in mind that these issues are probably more important today than they were just ten or twenty years ago. Why? Because so many people now work at home, and few home offices have had the benefit of professional layout and design that typically goes into most formal workplaces.

**TEMPERATURE**  The effects of heat on performance of people performing heavy *physical* activities have been well documented. But there are negative effects on employees doing *mental* tasks as well. In contrasting individuals working in 95-degree (F) temperatures versus 70 degrees, the former condition produced more errors, with the difference becoming especially great as the number of hours of exposure extended beyond three.

The effects of cold are not as severe. The performance of manual tasks is not affected until skin temperatures fall below 55 degrees. On mental tasks, the available evidence suggests that cold is relatively unimportant.

Temperature is one variable where large individual differences exist. One person’s “heavenly” temperature is someone else’s “hell.”
So, to maximize productivity, it’s important that employees work in an environment in which temperature is regulated so as to fall within an individual’s acceptable range. This implies some justification for creating individualized, temperature-controlled work spaces. It also suggest that organizations have dress codes that are flexible enough to allow employees to dress according to their own physical needs.

**NOISE** Noise intensity or loudness is measured by decibels, which is a logarithmic scale. A 10-decibel difference in intensity is actually a tenfold difference in sound level. The evidence from noise studies indicates that constant or predictable noises do not generally cause deterioration in work performance. If there is, it is at levels of about 90 decibels, which is equivalent to the noise generated by a subway train at 20 feet. To put this in perspective, the typical decibel level in an accounting office is less than 60 decibels, and the noise levels in printing press plants are rarely in excess of 85 decibels.

In contrast, the effects of unpredictable noise appear to be uniformly negative. Such noises tend to interfere with an employee’s ability to concentrate and pay attention. Loud and unpredictable noises also tend to increase excitation and lead to reduced job satisfaction.

Most offices and factories have noise levels in the low to moderate range. However, where levels are high or unpredictable, organizations should consider installing sound-absorbent surfaces (such
as acoustical ceilings, carpets, and drapes) and equipment reflecting recent developments in white-sound technology that mask noise.

**LIGHTING** You know how reading in the dark puts a strain on your eyes. You undoubtedly study better with good light rather than dim illumination. But what is the optimum lighting level? And does performance improve in a linear fashion as light intensity goes from low to moderate to high?

The right light intensity depends upon task difficulty and required accuracy. For difficult tasks that require attention to detail, illumination levels as high as 100 to 150 footcandles are typically appropriate. This would include activities like keyboarding, number verification, and proofreading. Difficult inspection tasks, such as checking for flaws in automobile paint, might require 500 footcandles. Loading and unloading materials, on the other hand, can be done effectively with 20 footcandles of light.

The right level of light intensity also is dependent on employee age. Gains in performance at higher levels of illumination are greater for older than younger employees.

Finally, the benefits from increased lighting are not linear. The benefits are greatest at relatively low levels of illumination, and decrease in magnitude as lighting increases to moderate and then high levels. You should expect only modest effects from increased lighting once some minimal level of illumination has been attained.
AIR QUALITY  It’s a well-established fact that breathing polluted air has adverse effects on personal health.\textsuperscript{46} Polluted air in cities such as Los Angeles, Phoenix, Denver, Mexico City, and Athens bring on headaches, burning eyes, fatigue, irritability, depression, and impaired judgment. To the extent that various pollutants are found in higher concentrations in work settings than in the community at large, employees can be at serious personal health risk.

In regard to job performance, the evidence indicates that several pollutants can reduce output or accuracy on many tasks. For example, exposure to carbon monoxide at concentrations commonly found along major roads has been found to significantly slow human reaction time and to reduce manual dexterity. This argues for organizations that have polluted workplaces to install air filtration equipment. Such filters can remove up to 99.75 percent of airborne particulate matter.

The trend toward smoke-free workplaces is a response to the negative effects of passive smoke. For instance, nonsmokers exposed to high concentrations of cigarette smoking (i.e., passive smoke) report increased feelings of irritation, fatigue, and anxiety.

A final note: People seem to adjust to polluted air. People become less concerned about, and feel less threatened by, high levels of pollution following prolonged exposure to such conditions.
Work Space Design

Now we turn to the actual design of the employee’s work space. Specifically, we’ll look at how the amount of that work space, its arrangement or layout, and the degree of privacy it provides affect an employee’s performance and satisfaction.

SIZE  Size is defined by the square feet per employee. While you might think that the task to be accomplished would be the major factor in determining how much space is provided for an employee, this is not the case. Status is the most important determinant of space.\(^47\) At least in North America, the higher an individual is in the organization’s hierarchy, the more space he or she typically gets.

The fact that status and space are highly correlated demonstrates the symbolic value that the amount of space one controls plays. By merely walking into a manager’s office and visually calculating his or her office size, you can immediately gauge this manager’s authority level.

In the management ranks, office space may be the most cherished and fought over reward that the organization offers, after money and titles. Because it connotes achievement and rank, it is not unusual for organizations, especially large ones, to define square footage for each level in the hierarchy. Senior executives, for instance, may be assigned 800 square feet plus 300 square feet for a private secretary’s office. A section manager may get 400 square
feet, a unit manager 120, and supervisors only 80 square feet. Clerical personnel may be relegated to sharing an eight-person office. Again, there is no necessary relationship between square footage required to do one’s job and the job assigned. And because status is the key determinant of workspace size, deviations from this pattern are likely to decrease job satisfaction for those individuals who perceive themselves on the short end of the discrepancy.

Furniture on wheels gives employees of Minneapolis-based ad agency Fallon McElligott flexibility in arranging their work space according to their task needs. For privacy, employees work in their office cubicles from desks that are specially equipped with a computer, files, and phone. But when art directors, space buyers, account managers, and copywriters need to team up for brainstorming sessions, they wheel their desks into an open area the agency calls “virtual” space.
ARRANGEMENT While size measures the amount of space per employee, arrangement refers to the distance between people and facilities. As we’ll show, the arrangement of one’s workplace is important primarily because it significantly influences social interaction.

There is a sizeable amount of research that supports that you’re more likely to interact with those individuals who are physically close. An employee’s work location, therefore, is likely to influence the information to which one is privy and one’s inclusion or exclusion from organization events. Whether you are on a certain grapevine network or not, for instance, will be largely determined by where you are physically located in the organization.

One topic that has received a considerable amount of attention is office arrangements, specifically the placement of the desk and where the officeholder chooses to sit. Unlike factory floors, individuals typically have some leeway in laying out their office furniture. And the arrangement of an office conveys nonverbal messages to visitors. A desk between two parties conveys formality and the authority of the officeholder, while setting chairs so individuals can sit at right angles to each other conveys a more natural and informal relationship.

PRIVACY As described at the opening of this chapter, AGI Inc. redesigned its employee work space to reduce privacy and increase communication. AGI is one among many organizations that have replaced traditional hierarchical work spaces with open offices.
Privacy is in part a function of the amount of space per person and the arrangement of that space. But it also is influenced by walls, partitions, and other physical barriers. Most employees desire a large degree of privacy in their jobs (especially in managerial positions, where privacy is associated with status). Yet most employees also desire opportunities to interact with colleagues, which are restricted as privacy increases.

Open offices, with minimal opportunities for privacy, are now being widely implemented. “From Manhattan towers to Silicon Valley tilt-ups, from behemoths, such as Mobil, IBM, and Procter & Gamble, to tiny startups, business is embracing new office designs for the twenty-first century.”51 These new office designs are consistent with the trend toward creating “work anywhere, anytime” offices, all made possible by advanced technology.52 The merging of voice mail, e-mail, fax, the World Wide Web, and private intranets makes it possible for organizations to tear down traditional walls and allow people to work in open offices, in their car, at home, or even in a client’s office.

There is growing evidence that the desire for privacy is a strong one on the part of many people.53 Privacy limits distractions, which can be particularly bothersome for people doing complex tasks. Yet the trend is clearly toward less privacy at the workplace. Further research is needed to determine whether or not organizational efforts
to open work spaces and individual preferences for privacy are incompatible and result in lower employee performance and satisfaction.

**Summary and an Integrative Model**

“In and of itself, [physical working conditions and workspace design] does not appear to have a substantial motivational impact on people. In other words, it does not induce people to engage in specific behaviors, but it can make certain behaviors easier or harder to perform. In this way, the effectiveness of people may be enhanced or reduced.” So it’s probably most accurate to think of the variables we’ve discussed in this section as ones that facilitate or hinder the opportunity for employees to optimize their performance.

Exhibit 14-6 summarizes the points made in this section. Work settings and conditions can directly influence an employee’s satisfaction, taking into consideration individual differences. Work settings and conditions may also indirectly facilitate or hinder an employee’s performance. When the work setting is poorly designed or uncomfortable for the employee, it can contribute to fatigue and hinder communication. Tired employees have difficulty in achieving both quantity and quality of output. Similarly, noise levels or physical partitions make it difficult for employees to interact or form informal group ties. But reactions are moderated by individual differences such as temperature preferences, length of time one has been exposed to polluted air, need for status, and need for social interaction.
Work Redesign Options

What are some of the options managers have at their disposal if they want to redesign or change the makeup of employee jobs? The following discusses four options: job rotation, job enlargement, job enrichment, and team-based designs.

Exhibit 14-6
The Influence of Physical Working Conditions and Work Space Design

Physical Environment
- Temperature
- Noise
- Lighting
- Air quality
Workspace Design
- Size
- Arrangement
- Privacy

Fatigue
Communication
Facilitate or hinder employee performance
Individual differences
Satisfaction
Job Rotation

If employees suffer from overroutinization of their work, one alternative is to use **job rotation** (or what many now call **cross-training**). When an activity is no longer challenging, the employee is rotated to another job, at the same level, that has similar skill requirements.55

G.S.I. Transcomm Data Systems Inc. in Pittsburgh uses job rotation to keep its staff of 110 people from getting bored.56 Over one two-year period, nearly 20 percent of Transcomm’s employees made lateral job switches. Management believes the job rotation program has been a major contributor to cutting employee turnover from 25 percent to less than 7 percent a year. Brazil’s Semco SA makes extensive use of job rotation. “Practically no one,” says Semco’s president, “stays in the same position for more than two or three years. We try to motivate people to move their areas completely from time to time so they don’t get stuck to the technical solutions, to ways of doing things in which they have become entrenched.”57 Mike Conway, CEO of America West Airlines, describes how his company fully cross-trains their customer service representatives. He says America West does it “to give the employees a better job, to give them more job variety. It’s more challenging, and for those who are interested in upward mobility, it exposes them to about 16 different areas of the company versus the one they would be exposed to if we specialized.”58

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**job rotation**
The periodic shifting of a worker from one task to another.
The strengths of job rotation are that it reduces boredom and increases motivation through diversifying the employee’s activities. Of course, it can also have indirect benefits for the organization since employees with a wider range of skills give management more flexibility in scheduling work, adapting to changes, and filling vacancies. On the other hand, job rotation is not without its drawbacks. Training costs are increased, and productivity is reduced by moving a worker into a new position just when his or her efficiency at the prior job was creating organizational economies. Job rotation also creates disruptions. Members of the work group have to adjust to the new employee. The supervisor may also have to spend more time answering questions and monitoring the work of the recently rotated employee. Finally, job rotation can demotivate intelligent and ambitious trainees who seek specific responsibilities in their chosen specialty.

**Job Enlargement**

More than 35 years ago, the idea of expanding jobs horizontally, or what we call **job enlargement**, grew in popularity. Increasing the number and variety of tasks that an individual performed resulted in jobs with more diversity. Instead of only sorting the incoming mail by department, for instance, a mail sorter’s job could be enlarged to include physically delivering the mail to the various departments or running outgoing letters through the postage meter.
Efforts at job enlargement met with less than enthusiastic results.\textsuperscript{59} As one employee who experienced such a redesign on his job remarked, “Before I had one lousy job. Now, through enlargement, I have three!” However, there have been some successful applications of job enlargement. For example, U.S. Shoe Co. created modular work areas to replace production lines in over half of its factories. In these work areas, workers perform two or three shoe-making steps instead of only one, as in traditional production lines. The result has been footwear produced more efficiently and with greater attention to quality.\textsuperscript{60}

So, while job enlargement attacked the lack of diversity in over-specialized jobs, it did little to instill challenge or meaningfulness to a worker’s activities. Job enrichment was introduced to deal with the shortcomings of enlargement.

**Job Enrichment**

*Job enrichment* refers to the vertical expansion of jobs. It increases the degree to which the worker controls the planning, execution, and evaluation of his or her work. An enriched job organizes tasks so as to allow the worker to do a complete activity, increases the employee’s freedom and independence, increases responsibility, and provides feedback, so an individual will be able to assess and correct his or her own performance.\textsuperscript{61}
Lawrence Buettner enriched the jobs of employees in his international trade banking department at First Chicago Corporation. His department’s chief product is commercial letters of credit—essentially a bank guarantee to stand behind huge import and export transactions. When he took over the department of 300 employees, he found paperwork crawling along a document “assembly line,” with errors creeping in at each handoff. And employees did little to hide the boredom they were experiencing in their jobs. Buettner replaced the narrow, specialized tasks that employees were doing with enriched jobs. Each clerk is now a trade expert who can handle a customer from start to finish. After 200 hours of training in finance and law, the clerks became full-service advisers who could turn around documents in a day while advising clients on such arcane matters as bank procedures in Turkey and U.S. munitions’ export controls. And the results? Productivity has more than tripled, employee satisfaction has soared, and transaction volume has risen more than 10 percent a year. Additionally, increased skills have translated into higher pay for the employees who are performing the enriched jobs. These trade service representatives, some of whom had come to the bank directly out of high school, now earn from $25,000 to $50,000 a year.

The First Chicago example shouldn’t be taken as a blanket endorsement of job enrichment. The overall evidence generally
shows that job enrichment reduces absenteeism and turnover costs and increases satisfaction, but on the critical issue of productivity, the evidence is inconclusive. In some situations, such as at First Chicago, job enrichment increases productivity; in others, it decreases it. However, even when productivity goes down, there does seem to be consistently more conscientious use of resources and a higher quality of product or service.

**Team-Based Work Designs Revisited**

Increasingly, people are doing work in groups and teams. What, if anything, can we say about the design of group-based work to try to improve employee performance in those groups? We know a lot more about individual-based work design than we do about design at the group level, mostly because the wide popularity of teams—specifically assigning tasks to a group of individuals instead of to a single person—is a relatively recent phenomenon. That said, the best work in this area offers two sets of suggestions.

First, the JCM recommendations seem to be as valid at the group level as they are at the individual level. Managers should expect a group to perform at a high level when (1) the group task requires members to use a variety of relatively high-level skills; (2) the group task is a whole and meaningful piece of work, with a visible outcome; (3) the outcomes of the group’s work on the task have
How does management enrich an employee’s job? The following suggestions, based on the job characteristics model, specify the types of changes in jobs that are most likely to lead to improving their motivating potential.64

1. **Combine tasks.** Managers should seek to take existing and fractionalized tasks and put them back together to form a new and larger module of work. This increases skill variety and task identity.

2. **Create natural work units.** The creation of natural work units means that the tasks an employee does form an identifiable and meaningful whole. This increases employee “ownership” of the work and improves the likelihood that employees will view their work as meaningful and important rather than as irrelevant and boring.

3. **Establish client relationships.** The client is the user of the product or service that the employee works on (and may be an “internal customer” as well as someone outside the organization). Wherever possible, managers should try to establish direct relationships between workers and their clients. This increases skill variety, autonomy, and feedback for the employee.

4. **Expand jobs vertically.** Vertical expansion gives employees responsibilities and control that were formerly reserved to management. It seeks to partially close
the gap between the “doing” and the “controlling” aspects of the job, and it increases employee autonomy.

**5. Open feedback channels.** By increasing feedback, employees not only learn how well they are performing their jobs, but also whether their performance is improving, deteriorating, or remaining at a constant level. Ideally, this feedback about performance should be received directly as the employee does the job, rather than from management on an occasional basis.

significant consequences for other people; (4) the task provides group members with substantial autonomy for deciding how they do the work; and (5) work on the task generates regular, trustworthy feedback about how well the group is performing.

Second, group composition is critical to the success of the work group. Consistent with findings described in Chapter 8, managers should try to ensure that the following four conditions are met: (1) Individual members have the necessary task-relevant expertise to do their work; (2) the group is large enough to perform the work; (3) members possess interpersonal as well as task skills; and (4) membership is moderately diverse in terms of talents and perspectives.
Work Schedule Options

Susan Ross is your classic “morning person.” She rises each day at 5 a.m. sharp, full of energy. On the other hand, as she puts it, “I’m usually ready for bed right after the 7 p.m. news.”

Susan’s work schedule as a claims processor at Hartford Insurance is flexible. It allows her some degree of freedom as to when she comes to work and when she leaves. Her office opens at 6 a.m. and closes at 7 p.m. It’s up to her how she schedules her eight-hour day within this 13-hour period. Because Susan is a morning person and also has a seven-year-old son who gets out of school at 3 p.m. every day, she opts to work from 6 a.m. to 3 p.m. “My work hours are perfect. I’m at the job when I’m mentally most alert, and I can be home to take care of Sean after he gets out of school.”

Most people work an eight-hour day, five days a week. They start at a fixed time and leave at a fixed time. But a number of organizations have introduced alternative work schedule options as a way to improve employee motivation, productivity, and satisfaction.

Compressed Workweek

The most popular form of compressed workweek is four ten-hour days.\(^67\) The 4–40 program was conceived to allow workers more leisure time and shopping time, and to permit them to travel to and from work at non–rush-hour times. Supporters suggest that

Compressed workweek
A four-day week, with employees working ten hours a day.
such a program can increase employee enthusiasm, morale, and commitment to the organization; increase productivity and reduce costs; reduce machine downtime in manufacturing; reduce overtime, turnover, and absenteeism; and make it easier for the organization to recruit employees.

Currently about 25 percent of major U.S. companies offer a four-day schedule for at least some of their workers. This is double what it was in the late 1980s. And a recent national survey found that two-thirds of working adults would prefer a four-day workweek to the standard five-day schedule.

Proponents argue that the compressed workweek may positively affect productivity in situations in which the work process requires significant start-up and shutdown periods. When start-up and shutdown times are a major factor, productivity standards take these periods into consideration in determining the time required to generate a given output. Consequently, in such cases, the compressed workweek will increase productivity even though worker performance is not affected, simply because the improved work scheduling reduces nonproductive time.

The evidence on 4–40 program performance is generally positive. While some employees complain of fatigue near the end of the day, and about the difficulty of coordinating their jobs with their personal lives—the latter a problem especially for working mothers—most like the 4–40 program. In one study, for instance,
when employees were asked whether they wanted to continue their 4–40 program, which had been in place for six months, or go back to a traditional five-day week, 78 percent wanted to keep the compressed workweek.72

**Shorter Workweek**

How does a reduced four-day, 32-hour workweek sound? What if it included a 20 percent cut in pay? A number of Western European countries are considering the former as a solution to high unemployment. But if unions have their way, it won’t be with any pay cut.73

Western Europe has 20 million unemployed workers. In an effort to deal with this problem, countries such as Germany, France, Spain, and Belgium are seriously considering spreading the available work among more people by cutting the workweek 20 percent. With the jobless rate nearly 12 percent and rising in France and Germany, political pressures are building for this proposal. Volkswagen, for instance, has given an ultimatum to the union that represents its 103,000 workers: Accept a four-day workweek with a 20 percent drop in pay, or nearly every third job will be cut.

It’s not clear at this point whether or not the 32-hour workweek will become the new standard in Western Europe. Moreover, even if it does, it isn’t certain that employees will have to take a commensurate cut in pay. Proposals currently being considered at the federal level include having employers absorb the full cost—paying work-
ers for 40 hours, even if they work only 32; having the government pick up the tab; or some combination of cost sharing among workers, employers, and government.

The impact on employees of a shorter workweek can only be speculative at this time. While the program would create more jobs, employees are likely to focus on how it affects them individually rather than the positive effect on their country’s employment. A 20 percent cut in hours, with no cut in pay, should have generally positive effects on employee satisfaction and negative effects on productivity. If the cut in hours is matched with a 20 percent reduction in pay, satisfaction is likely to drop.

**Flextime**

Flextime is a scheduling option that allows employees, within specific parameters, to decide when to go to work. Susan Ross’s work schedule at Hartford Insurance is an example of flextime. But what specifically is flextime?

**Flextime** is short for flexible work hours. It allows employees some discretion over when they arrive at and leave work. Employees have to work a specific number of hours a week, but they are free to vary the hours of work within certain limits. As shown in Exhibit 14-7, each day consists of a common core, usually six hours, with a flexibility band surrounding the core. For exam-
ple, exclusive of a one-hour lunch break, the core may be 9:00 a.m. to 3:00 p.m., with the office actually opening at 6:00 a.m. and closing at 6:00 p.m. All employees are required to be at their jobs during the common core period, but they are allowed to accumulate their other two hours before and/or after the core time. Some flex-time programs allow extra hours to be accumulated and turned into a free day off each month.

Flextime has become an extremely popular scheduling option. For instance, a recent study of firms with more than 1,000 employees found that 53 percent offered employees the option of flextime.74

The benefits claimed for flextime are numerous. They include reduced absenteeism, increased productivity, reduced overtime expenses, a lessening in hostility toward management, reduced traffic congestion around work sites, elimination of tardiness, and increased autonomy and responsibility for employees that may increase employee job satisfaction.75 But beyond the claims, what’s flextime’s record?

Most of the performance evidence stacks up favorably. Flextime tends to reduce absenteeism and frequently improves worker productivity,76 probably for several reasons. Employees can schedule their work hours to align with personal demands, thus reducing tardiness and absences, and employees can adjust their work activities to those hours in which they are individually more productive.
Flext ime’s major drawback is that it’s not applicable to every job. It works well with clerical tasks where an employee’s interaction with people outside his or her department is limited. It is not a viable option for receptionists, sales personnel in retail stores, or similar jobs where comprehensive service demands that people be at their work stations at predetermined times.

**Job Sharing**

A recent work scheduling innovation is **job sharing**. It allows two or more individuals to split a traditional 40-hour-a-week job. So, for example, one person might perform the job from 8 a.m. to noon,
Alternative work schedules, which not too long ago were viewed as disruptions to the office workplace and as a “mothers only” perk, have become an important strategic tool as organizations try to offer the flexibility their employees need in a changing society.

Bank of America, San Francisco, for example, has 12,000 workers who use flextime, 4,800 on compressed workweeks, 2,000 who job share, 1,300 who work at home at least one day a week, and 500 part-time employees.

A business unit of Continental Corp. in upstate New York has 200 of its 207 employees on alternative schedules. Bechtel Corp., the worldwide construction firm, makes extensive use of compressed workweeks.

Three societal changes are driving this alternative work schedule movement. First, fewer women are at home to provide care for children or elderly parents. Second, there is less willingness of people to be married to a job. And third, changing technology like networked computers, phones, and faxes make the location where work is performed less relevant.

while another performs the same job from 1 p.m. to 5 p.m.; or the
two could work full, but alternate, days.

Although job sharing is growing in popularity, it is less wide-
spread than flextime. Only about 30 percent of large organizations
offer this option.\textsuperscript{77} And in contrast to flextime, only a very small per-
centage of employees actually use the option.\textsuperscript{78} Xerox is one organi-
zation that does. Laura Meier and Lori Meagher, for instance, share a
sales management position at Xerox.\textsuperscript{79} Both are mothers of
preschoolers and wanted greater flexibility, but they didn’t want
to give up their managerial careers at Xerox. So now Laura oversees
their eight sales reps on Thursdays and Fridays, Lori has the job on
Mondays and Tuesdays, and the two women work alternate
Wednesdays.

From management’s standpoint, job sharing allows the organi-
zation to draw upon the talents of more than one individual in a
given job. A bank manager who oversees two job sharers describes it
as an opportunity to get two heads, but “pay for one.” It also opens up the opportunity to acquire skilled workers—for instance, women with young children and retirees—who might not be available on a full-time basis. From the employee’s viewpoint, job sharing increases flexibility. As such, it can increase motivation and satisfaction for those to whom a 40-hour-a-week job is just not practical.

**Telecommuting**

It might be close to the ideal job for many people. No commuting, flexible hours, freedom to dress as you please, and little or no interruptions from colleagues. It’s called telecommuting and refers to employees who do their work at home on a computer that is linked to their office. Currently, about 10 million people work at home in the United States doing things like taking orders over the phone, filling out reports and other forms, and processing or analyzing information. Telecommuting is presently the fastest-growing trend in work scheduling. One projection, for instance, predicts that by the year 2000, more than 60 million American workers—about half the work force—will do some kind of work at home. Employers have been enthusiastic about the concept, claiming it enhances worker productivity, improves the organization’s ability to retain valuable employees, and increases employee loyalty.
American Express Travel Services is one organization whose experience with telecommuting has been very positive. In 1993, 100 AmEx travel agents in 15 locations were telecommuters. The company can connect these people's homes to American Express's phone and data lines for a modest one-time expense of $1,300 each, including hardware. Once in place, calls to AmEx's reservation service are seamlessly routed to workers at home, where they can look up fares and book reservations on PCs. The typical telecommuting agent at AmEx handles 26 percent more calls at home than at the office. Why? One agent thinks it's due to an absence of distractions: “I don't feel like I'm working any harder. It's just that I don't have Suzy next to me telling me her husband is a jerk. I'm not worried about who's going into the boss's office, or noticing who's heading to the bathroom for the tenth time today.” Additionally, as more agents become telecommuters and free up office space, the company will generate substantial savings in rent. For instance, in New York City, it costs AmEx nearly $4,400 a year to rent the 125 square feet of space each travel agent occupies.

Not all employees embrace the idea of telecommuting. After the massive Los Angeles earthquake in January 1994, many L.A. firms began offering telecommuting for their workers. It was popular for a week or two, but that soon faded. Many workers complained they were missing out on important meetings and informal inter-
actions that led to new policies and ideas. The vast majority were willing to put up with two- and three-hour commutes, while bridges and freeways were being rebuilt, in order to maintain their social contacts at work.

The long-term future of telecommuting depends on some questions for which we don’t yet have definitive answers. For instance, will employees who do their work at home be at a disadvantage in office politics? Might they be less likely to be considered for salary increases and promotions? Is being out of sight equivalent to being out of mind? Will non–work-related distractions like children, neighbors, and the close proximity of the refrigerator significantly reduce productivity for those without superior will power and discipline?

**Summary and Implications for Managers**

An understanding of work design can help managers design jobs that positively affect employee motivation. For instance, jobs that score high in motivating potential increase an employee’s control over key elements in his or her work. Therefore, jobs that offer autonomy, feedback, and similar complex task characteristics help to satisfy the individual goals of those employees who desire greater control over their work. Of course, consistent with the social information processing model, the perception that task characteristics
are complex is probably more important in influencing an employee’s motivation than the objective task characteristics themselves. The key, then, is to provide employees with cues that suggest that their jobs score high on factors such as skill variety, task identity, autonomy, and feedback.

Technology is changing people’s jobs and their work behavior. TQM and its emphasis on continuous process improvement can increase employee stress as individuals find that performance expectations are constantly being increased. Reengineering is eliminating millions of jobs and completely reshaping the jobs of those who remain. Flexible manufacturing systems require employees to learn new skills and accept increased responsibilities. And technology is making many job skills obsolete and shortening the life span of almost all skills—technical, administrative, and managerial. Work conditions and design variables such as temperature, noise, lighting, air quality, work space size, interior layout and arrangement, and degree of privacy can directly influence employee satisfaction. In addition, they indirectly affect employee productivity by influencing communication and employee fatigue.

Alternative work schedule options such as the compressed workweek, shorter workweeks, flextime, job sharing, and telecommuting have grown in popularity in recent years. They have become an important strategic tool as organizations try to increase the flexibility their employees need in a changing workplace.
For Review

1. Describe three jobs that score high on the JCM. Describe three jobs that score low.
2. What are the implications of the social information processing model for predicting employee behavior?
3. What are the implications for employees of a continuous improvement program?
4. What are the implications for employees of a reengineering program?
5. What are flexible manufacturing systems?
6. How could you design an office so as to increase the opportunity for employees to be productive?
7. What can you do to improve employee performance on teams through work design?
8. What are the advantages of flextime from an employee’s perspective? From management’s perspective?
9. What are the advantages of job sharing from an employee’s perspective? From management’s perspective?
10. From an employee’s perspective, what are the pros and cons to telecommuting?
For Discussion

1. Reengineering needs to be autocratically imposed in order to overcome employee resistance. This runs directly counter to the model of a contemporary manager who is a good listener, a coach, motivates through employee involvement, and who possesses strong team support skills. Can these two positions be reconciled?

2. How has technology changed the manager’s job over the past 20 years?

3. Would you want a full-time job telecommuting? How do you think most of your friends would feel about such a job? Do you think telecommuting has a future?

4. What can management do to improve employees’ perceptions that their jobs are interesting and challenging?

5. What are the implications of worker obsolescence on (a) society; (b) management practice; and (c) you, as an individual, planning a career?
The Notion of Jobs Is Becoming Obsolete

Prior to 1800, very few people had a job. People worked hard raising food or making things at home. They had no regular hours, no job descriptions, no bosses, and no employee benefits. Instead, they put in long hours on shifting clusters of tasks, in a variety of locations, on a schedule set by the sun and the weather and the needs of the day. It was the industrial revolution and the creation of large manufacturing companies that brought about the concept of what we have come to think of as jobs. But the conditions that created “the job” are disappearing. Customized production is pushing out mass production; most workers now handle information, not physical products; and competitive conditions are demanding rapid response to changing markets. While economists and social analysts continue to talk about the disappearance of jobs in certain countries or industries, they’re missing a more relevant point: What’s actually disappearing is the job itself.

In a fast-moving economy, jobs are rigid solutions to an elastic problem. We can rewrite a person’s job description occasionally, but not every week. When the work that needs doing changes constantly—which increasingly describes today’s world—organizations can’t afford the inflexibility that traditional jobs bring with it.

In the near future, very few people will have jobs as we have come to know them. In place of jobs, there will be part-time and temporary work situations. Organizations will be transformed from a structure built out of jobs into a field of work needing to be done. And these organizations will be essentially made up of “hired guns”—contingent employees (temporaries, part-timers, consultants, and contract workers) who join project teams created to complete a specific task. When that task is finished, the team disbands. People will work on more than one team at a time, keeping irregular hours, and maybe never meeting their co-workers face-to-face. Computers, pagers, cellular phones, modems, and the like will allow people to work for multiple employers, at the same time, in locations
throughout the world. Few of these employees will be working nine to five at specific work spots. And they'll have little of the security that their grandfathers had, who worked for U.S. Steel, General Motors, Sears, Bank of America, or similar large bureaucracies. In place of security and predictability, they’ll have flexibility and autonomy. They’ll be able to put together their own place-time combinations to support their diverse work, family, lifestyle, and financial needs.

This argument is based on W. Bridges, *JobShift* (Reading, MA: Addison-Wesley, 1994).
Jobs Are the Essence of Organizational Life

The central core to any discussion of work or organizational behavior is the concept of a job. It is the aggregation of tasks that defines an individual’s duties and responsibilities.

When an organization is created, managers have to determine what tasks need to be accomplished for the organization to achieve its goals and who will perform those tasks. These decisions precede the hiring of a work force. Remember, it’s the tasks that determine the need for people, not the other way around. Job analysis is the formal process managers use to define the jobs within the organization and the behaviors that are necessary to perform those jobs. For instance, what are the duties of a purchasing specialist, grade 3, who works for International Paper? What minimal knowledge, skills, and abilities are necessary for adequate performance of a grade 3 purchasing specialist’s job? How do the requirements for a purchasing specialist, grade 3, compare with those for a purchasing specialist, grade 2, or a purchasing analyst? These are questions that job analysis can answer.

Can you conceive of an organization without jobs? No more than you can conceive of a car without an engine. There are no doubt changes taking place in organizations that are requiring managers to redefine what a job is. For instance, today’s jobs often include extensive customer interaction as well as team responsibilities. In many cases, organizations are having to make job descriptions more flexible to reflect the more dynamic nature of work today. Because it’s inefficient to rewrite job descriptions on a weekly basis, managers are rethinking what makes up a job and defining jobs in more fluid terms. But the concept of jobs continues to be at the core of any work design effort and a fundamental cornerstone to understanding formal work behavior in organizations.

For those who believe that the concept of jobs is on the wane, all they need to do is look to the trade union movement and its determination to maintain clear job delineations. Labor unions have a vested interest in the status quo and will fight hard to pro-
tect the security and predictability that traditional jobs provide. Moreover, if it looked like the jobless society was to become a widespread reality, politicians would be under strong pressure to create legislation to outlaw it. A world of part-time and temporary employment is a threat to the stability of our society. Working people want stability and predictability, and they will look to their elected representatives to protect that. Those politicians who ignore this desire face the wrath of the electorate.
Learning about Yourself Exercise

Is an Enriched Job for You?

INSTRUCTIONS People differ in what they like and dislike in their jobs. Listed below are twelve pairs of jobs. For each pair, indicate which job you would prefer. Assume that everything else about the jobs is the same—pay attention only to the characteristics actually listed for each pair of jobs. If you would prefer the job in Column A, indicate how much you prefer it by putting a check mark in a blank to the left of the Neutral point. If you prefer the job in Column B, check one of the blanks to the right of Neutral. Check the Neutral blank only if you find the two jobs equally attractive or unattractive. Try to use the Neutral blank rarely.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
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<tbody>
<tr>
<td>1. A job that offers little or no challenge.</td>
<td>A job that requires you to be completely isolated from co-workers.</td>
</tr>
<tr>
<td>2. A job that pays well.</td>
<td>A job that allows considerable opportunity to be creative and innovative.</td>
</tr>
<tr>
<td>3. A job that often requires you to make important decisions.</td>
<td>A job in which there are many pleasant people to work with.</td>
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### Column A

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<td>4.</td>
<td>A job with little security in a somewhat unstable organization.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<td>5.</td>
<td>A job in which greater responsibility is given to those who do the best work.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<td>6.</td>
<td>A job with a supervisor who sometimes is highly critical.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<td>7.</td>
<td>A very routine job.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<td>8.</td>
<td>A job with a supervisor who respects you and treats you fairly.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<td>9.</td>
<td>A job that gives you a real chance to develop yourself personally.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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### Column B

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<tr>
<td>A job in which you have little or no opportunity to participate in decisions that affect your work.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<tr>
<td>A job in which greater responsibility is given to loyal employees who have the most seniority.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
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<td>A job that does not require you to use much of your talent.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<td>A job in which your coworkers are not very friendly.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<tr>
<td>A job that provides constant opportunities for you to learn new and interesting things.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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<td>A job with excellent vacation and fringe benefits.</td>
<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
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Working With Others Exercise

Analyzing and Redesigning Jobs

Break into groups of five to seven members each. Each student should describe the worst job he or she has ever had. Use any criteria you want to select one of these jobs for analysis by the group.

---

Column A

10. A job in which there is a real chance you could be laid off.

11. A job with little freedom and independence to do your work in the way you think best.

12. A job with very satisfying teamwork.

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<td>Strongly prefer A</td>
<td>Neutral</td>
<td>Strongly prefer B</td>
<td>Strongly prefer B</td>
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Column B

A job with very little chance to do challenging work.

A job with poor working conditions.

A job that allows you to use your skills and abilities to the fullest extent.

Turn to page 1484 for scoring directions and key.

Members of the group will analyze the job selected by determining how well it scores on the job characteristics model. Use the following scale for your analysis of each job dimension:

7 = Very high  
6 = High  
5 = Somewhat high  
4 = Moderate  
3 = Somewhat low  
2 = Low  
1 = Very low

Following are sample questions that can guide the group in its analysis of the job in question:

- **Skill variety**: Describe the different identifiable skills required to do this job. What is the nature of the oral, written, and/or quantitative skills needed? Physical skills? Does the jobholder get the opportunity to use all of his or her skills?

- **Task identity**: What is the product that the jobholder creates? Is he or she involved in its production from beginning to end? If not, is he or she involved in a particular phase of its production from beginning to end?
- **Task significance**: How important is the product? How important is the jobholder's role in producing it? How important is the jobholder's contribution to the people he or she works with? If the jobholder's job were eliminated, how inferior would the product be?

- **Autonomy**: How much independence does the jobholder have? Does he or she have to follow a strict schedule? How closely is he or she supervised?

- **Feedback**: Does the jobholder get regular feedback from his or her supervisor? From peers? From subordinates? From customers? How about intrinsic performance feedback when doing the job?

Using the formula in Exhibit 14-3, calculate the job's motivating potential. Then using the suggestions offered in the chapter for redesigning jobs, describe specific actions management could take to increase this job's motivating potential.

Calculate the costs to management of redesigning the job in question. Do the benefits exceed the costs?

Conclude the exercise by having a representative of each group share his or her group's analysis and redesign suggestions with the entire class. Possible topics for class discussion might include: similarities in the jobs chosen, problems in rating job dimensions, and the cost-benefit assessment of design changes.

Reengineering the College Experience

At the turn of the century, less than 2 percent of high school graduates went on to college. For the most part, college in those days was an elitist experience reserved for children of the upper class. Today, in places like the United States, approximately 60 percent of high school graduates continue on to college. In the 1990s, in much of the world, higher education has become a product for the masses.

While higher educational institutions now serve a much broader and diverse audience, the structure of colleges and their basic curricula have not changed much since the turn of the century. Critics claim that the typical undergraduate experience—four years of course work, broken down into eight or twelve terms, with students taking three to six courses per term, taught mostly by full-time instructors who lecture to their classes—makes little sense today. For example, we realize knowledge isn’t compartmentalized by narrow departmental specialties nor into three-unit segments, but that’s how it tends to be taught. Additionally, while lecturing made sense a century ago, it is a rather outdated means for transferring information when students have ready access to libraries and on-line databases. Critics also challenge a number of other well-established practices of colleges and universities: expansive campuses with dormitories and other facilities for resident students when, in fact, most students commute; accreditation processes that legitimize the fac-
ulty’s academic credentials, the importance of research, the use of full-time over part-time faculty, and the granting of tenure; the heavy subsidizing of public education by taxpayers; and the unresponsiveness of faculty and administrators to the need for change.

What would a college look like if it were reengineered? Vassar College, for instance, recently announced that it was eliminating tenure for new faculty. National University in San Diego breaks its curriculum into monthly courses that are offered all year around, and taught almost entirely by working practitioners rather than full-time faculty. And some colleges are experimenting with team-teaching classes with faculty from diverse disciplines. But these represent only incremental changes. True reengineering would require creating an entire new structure and curriculum from scratch.

Questions

1. List as many characteristics of your college as you can that you think hinder its effectiveness in the 1990s.

2. What do you think a reengineered college structure and curriculum would look like?

3. In times of dramatic societal change, colleges and universities remain relatively stable. College campuses haven’t changed much from those that your parents or grandparents might have encountered. What changes have occurred that have either been incremental or introduced by newly developed colleges? In
times when almost every business firm is having to completely overhaul its traditional practices, why do most established colleges and universities continue to operate as they always have?

### Spying on Employees

Big Brother is watching you! Some corporations have been spying on employees at work, and even in instances when they’re not at work. Sheraton Hotels is doing it. So is Kmart.

Francklin Etienne and Brad Fair were among dozens of Sheraton employees secretly videotaped at work—and not just while they were doing their jobs. Brad, for instance, was taped undressing in the employees’ locker room. Francklin was “caught” reading a book during his scheduled break. Sheraton officials defend their actions by saying secret videotaping did result in nabbing one drug-dealing employee. However, Etienne, a Haitian immigrant, can’t reconcile this action by his employer and the U.S. preoccupation with freedom. He says, “When I found out I was on the tape, I said to myself, ‘Where is the privacy they’re always talking about? Where is the freedom they’re talking about?’”

Lew Hubble’s experience at a Kmart warehouse was more personal. He learned that two co-workers whom he had befriended were actually private investigators hired by Kmart to compile reports on employees by going to local bars with them, visiting
them at their homes, and the like. These reports contained information that had little or nothing to do with employees’ jobs. For instance, one such report said that an employee had fathered another employee’s child, and the report identified the employees by name. Kmart management wouldn’t speak about these actions on the record, but managers defended their use of private investigators by saying they were hired to help break up an “inside” theft ring. Said one warehouse employee, “What takes place in that warehouse, they have a right to know. They do not have a right to know what goes on in my bedroom, in my living room.”

These aren’t isolated examples. It has been estimated that at least 6 million American workers are spied on at work each year. This spying takes various forms—listening in on phone calls, videotaping work areas, reviewing computer entries, and monitoring e-mail. And there’s little that employees can do to stop management from spying on them, on or off company property. There is a federal law to keep employers from listening to workers’ personal phone calls, but other than that, there is almost no protection from prying eyes on the job.

Questions

1. When does spying cross the line from effective management controls to invasion of employee privacy?
2. Would your perception of Sheraton’s or Kmart’s management be any better if it had told employees ahead of time that they
might be videotaped anywhere or that undercover private investigators had been hired to monitor illegal activities by employees? Discuss.

3. Do you think the decrease in employee morale and trust as a result of these spying practices is offset by reductions in property loss and gains in productivity (for example, by identifying and terminating employees who steal or use illegal drugs)?

4. Personal digital assistants, networked computers, and similar new technologies are only likely to make it easier for employers to monitor employees. How do you feel about this? What controls, if any, do you expect your employer to implement to protect your privacy and freedoms?