The History of Management

Chapter 2

CHAPTER OUTLINE

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Key Terms

Concept Check

Self-Assessment

Management Decision

Management Team Decision

Develop Your Career Potential

Take Two Video

STUDENT RESOURCES

ThomsonNOW On the Job and Biz Flix video applications, concept tutorial, and concept exercise

Xtra! Four exhibit worksheets, author FAQs, quiz, Management News, and video clips from the chapter with exercises

Web (http://williams.swlearning.com) Quiz, PowerPoint slides, and the glossary of terms for this chapter

ISG Steelton–International Steel Group, Steelton, Pennsylvania.[1] As the day shift supervisor at the steel plant, you summon the six college students who are working for you this summer doing whatever you need done (sweeping up, sandblasting the inside of boilers that are down for maintenance, running errands, etc.). You walk them across the plant to a field where the company stores scrap metal "leftovers." The area, about the size of a football field, is stacked with organized piles of metal. You explain that everything they see has just been sold. Metal prices, which have been depressed, have finally risen enough that the company can earn a small profit by selling its scrap.

You point out that railroad tracks divide the field into parallel sectors, like the lines on a football field, so that each stack of metal is no more than 15 feet from a track. Each stack contains 390 pieces of metal. Each piece weighs 92 pounds and is about a yard long and just over 4 inches high and 4 inches wide. You tell the students that working as a team, they are to pick up each piece, walk up a ramp to a railroad car that will be positioned next to each stack, and then neatly position and stack the metal for shipment. That's right, you repeat, *92* pounds, *walk* up the ramp, and *carry* the metal onto the rail car. Anticipating their questions, you explain that a forklift could be used only if the metal was stored on wooden pallets (it isn't), if the pallets could withstand the weight of the metal (they would be crushed), and if you, as their supervisor, had forklifts and people trained to run them (you don't). In other words, the only way to get the metal into the rail cars is for the students to carry it.

What Would You Do?

Based on an old report from the last time the company sold some of the metal, you know that over an eight-hour shift workers typically loaded about 30 to 31 pieces of metal parts per hour. At that pace, though, it will take your six students six weeks to load all of the metal, and the purchasing manager who sold it says it must be shipped in two weeks. So, without more workers (there's a hiring freeze) and without forklifts, all of the metal has to be loaded by hand by these six workers in two weeks. But how do you do that? What would motivate the students to work much, much harder than they have all summer? They've gotten used to a leisurely pace and easier job assignments. Motivation might help, but motivation will only get so much done. After all, short of illegal steroids, nothing is going to work once muscle fatigue kicks in from carrying those 92-pound pieces of metal up a ramp all day long. So, what can you change about the way the work is done to deal with the unavoidable physical fatigue? **If you were the supervisor in charge, what would you do?**

STUDY TIP

Find a study partner and have him or her quiz you using materials from Xtra! Instead of just giving the simple answer, try to give the rationale as well.

Certainly, the problems that the ISG steel plant supervisor is facing in the *What Would You Do?* case are difficult, but they aren't unique. Each day, managers are asked to solve challenging problems and are given only a limited amount of time, people, or resources. Yet it's still their responsibility to get things done on time and within budget. Furthermore, most of the management practices and ideas that today's managers use to solve their daily problems have their roots in the people and ideas you'll read about in this chapter on the history of management. Indeed, by reading the theories in this chapter, you will be able to figure out a solution to the ISG supervisor's problems.

We begin this chapter by reviewing the origins of management ideas and practice throughout history and the historical changes that produced the need for managers. Next, you'll learn about various schools of management thought. Beginning with scientific management, you'll learn about the key contributions made by Frederick Taylor, Frank and Lillian Gilbreth, and Henry Gantt. Next, you'll read about Max Weber and bureaucratic management and then about Henri Fayol and administrative management. Following that, you'll learn about human relations management and the ideas of Mary Parker Follett (constructive conflict and coordination), Elton Mayo (Hawthorne Studies), and Chester Barnard (cooperation and acceptance of authority). Finally, you'll learn about the history of operations management, information management, systems management, and contingency management.

In the Beginning

In this textbook, you learn that *management* is getting work done through others, that *strategic* plans are overall plans that clarify how a company will serve customers and position itself against competitors over the next two to five years, and that *just-in-time inventory* is a system in which the parts needed to make something arrive from suppliers just as they are needed at each stage of production. Today's managers would undoubtedly view those ideas and many of the others presented in the book as self-evident. For example, tell today's managers to "reward workers for improved production or performance," "set specific goals to increase motivation," or "innovate to create and sustain a competitive advantage," and they'll respond, "Duh! Who doesn't know that?" A mere 125 years ago, however, business ideas and practices were so different that today's widely accepted management ideas would have been as "self-evident" as space travel, cell phones, and the Internet. In fact, 125 years ago, management wasn't yet a field of study, and there were no management jobs and no management careers. Now, of course, managers and management are such an integral part of the business world that it's hard to imagine organizations without them. So, if there were no managers 125 years ago, but you can't walk down the hall today without bumping into one, where did management come from?

After reading the next section, you should be able to

1 explain the origins of management.

1 THE ORIGINS OF MANAGEMENT

Management as a field of study may be just 125 years old, but management ideas and practices have actually been used from the earliest times of recorded history. For example, 2,500 years before management researchers called it *job enrichment*, the Greeks learned that they could improve the productivity of boring repetitious tasks by performing them to music. The basic idea was to use a flute, drum, or song lyrics to pace people to work in unison using the same

efficient motions, stimulate them to work faster and longer, and make the boring work more fun.[2] Although we can find the seeds of many of today's management ideas throughout history, not until the last two centuries did systematic changes in the nature of work and organizations create a compelling need for managers.

Let's begin our discussion of the origins of management by learning about **1.1 management ideas and practice throughout history** and **1.2 why we need managers today.**

1.1 Management Ideas and Practice throughout History

Examples of management thought and practice can be found throughout history.[3] For example, as shown in Exhibit 2.1, in 5000 B.C. in an early instance of managing information, which is part of the control function, Sumerian priests developed a formal system of writing (scripts) that allowed them to record and keep track of the goods, flocks and herds of animals, coins, land, and buildings that were contributed to their temples. Furthermore, to encourage honesty in such dealings, the Sumerians instituted managerial controls that required all priests to submit written accounts of the transactions, donations, and payments they handled to the chief priest. And just like clay or stone tablets and animal-skin documents, these scripts were first used to manage the business of Sumerian temples.[4] Only later were the scripts used for religious purposes.

Exhibit 2.1
Management Ideas and Practice throughout History

Time	Individual or Group	Planning	Organizing	Leading	Controlling	Contributions to Management Thought and Practice
5000 B.C.	Sumerians				√	Record keeping.
4000 B.C. to 2000 B.C.	Egyptians	√	√		√	Recognized the need for planning, organizing, and controlling when building the pyramids. Submitted requests in writing. Made decisions after consulting staff for advice.
1800 B.C.	Hammurabi				√	Established controls by using witnesses (to vouch for what was said or done) and writing to document transactions.
600 B.C.	Nebuchadnezzar		√	√		Wage incentives and production control.
500 B.C.	Sun Tzu	√		√		Strategy; identifying and attacking opponent's weaknesses.
400 B.C.	Xenophon	√	√	√	√	Recognized management as a separate art.
400 B.C.	Cyrus		√	√	√	Human relations and motion study.
175	Cato		√			Job descriptions.
284	Diocletian		√			Delegation of authority.
900	Alfarabi			√		Listed leadership traits.
1100	Ghazali			√		Listed managerial traits.
1418	Barbarigo		√			Different organizational forms/structures.
1436	Venetians				√	Numbering, standardization, and interchangeability of parts.
1500	Sir Thomas More			√		Critical of poor management and leadership.
1525	Machiavelli		√	√		Cohesiveness, power, and leadership in organizations.

Source: C. S. George, Jr., *The History of Management Thought* (Englewood Cliffs, NJ: Prentice Hall, 1972).

A thousand years after the Sumerians, the Egyptians recognized the need for planning, organizing, and controlling; for submitting written requests; and for consulting staff for advice before making decisions. The practical problems they encountered while building the great pyramids no doubt led to the development of these management ideas. The enormity of the task they faced is evident in the pyramid of King Cheops, which contains 2.3 million blocks of stone. Each block had to be quarried, cut to precise size and shape, cured (hardened in the sun), transported by boat for two to three days, moved onto the construction site, numbered to identify where it would be placed, and then shaped and smoothed so that it would fit perfectly into place. It took 20,000 workers 23 years to complete this pyramid; more than 8,000 were needed just to quarry the stones and transport them. A typical "quarry expedition" might include 100 army officers, 50 government and religious officials, and 200 members of the king's court to lead the expedition; 130 stone masons to cut the stones; and 5,000 soldiers, 800 barbarians, and 2,000 bond servants to transport the stones on and off the ships.[5]

The remainder of Exhibit 2.1 shows how other management ideas and practices throughout history are clearly related to the management functions in the textbook. Besides the achievements of the Sumerians and Egyptians, we might note King Hammurabi, who established controls by using witnesses and written documents; King Nebuchadnezzar, who pioneered techniques for producing goods and using wages to motivate workers; Sun Tzu, author of *The Art of War*, who emphasized the importance of strategy and identifying and attacking an opponent's weaknesses; Xenophon, who recognized management as a distinct and separate art; King Cyrus, who recognized the importance of human relations and used motion study to eliminate wasteful steps and improve productivity; Cato, who espoused the importance of job descriptions; Diocletian, a Roman emperor, who mastered the art of delegation by dividing the widespread Roman Empire into 101 provinces, which were then grouped into 13 dioceses, which were in turn grouped into four geographic divisions; Alfarabi and Ghazali, who began defining what it takes to be a good leader or manager; Barbarigo, who discussed the different ways in which organizations could be structured; the Venetians, who used numbering and standardization to make parts interchangeable; Sir Thomas More, who, in his book *Utopia*, emphasized the negative societal consequences associated with poor leadership; and Machiavelli, who wrote about the importance of cohesion, power, and leadership in organizations.

1.2 Why We Need Managers Today

Working from 8 A.M. to 5 P.M., coffee breaks, lunch hours, crushing rush hour traffic, and punching a time clock are things we associate with today's working world. Work hasn't always been this way, however. In fact, the design of jobs and organizations has changed dramatically over the last 500 years.

For most of humankind's history, people didn't commute to work. In fact, travel of any kind was arduous and extremely rare.[6] Work usually occurred in homes or on farms. For example, in 1720, almost 80 percent of the 5.5 million people in England lived and worked in the country. Indeed, as recently as 1870, two-thirds of Americans earned their living from agriculture. Even most of those who didn't earn their living from agriculture didn't commute to work. Skilled tradesmen or craftsmen, such as blacksmiths, furniture makers, and leather goods makers who formed trade guilds (the historical predecessors of labor unions) in England as early as 1093, typically worked out of shops in or next to their homes.[7] Likewise, cottage workers worked with each other out of small homes that were often built in the shape of a semicircle. A family in each cottage

would complete a different production step with work passed from one cottage to the next until production was complete. For example, textile work was a common "cottage industry": families in different cottages would shear the sheep; clean the wool; comb, bleach, and dye it; spin it into yarn; and weave the yarn into cloth. Yet, with no commute, no bosses (workers determined the amount and pace of their work), and no common building (from the time of the ancient Egyptians, Greeks, and Romans through the middle of the nineteenth century, it was rare for more than 12 people to work together under one roof), cottage work was very different from today's jobs and companies.[8] And because these work groups were small and typically self-organized, there wasn't a strong need for management.

During the Industrial Revolution (1750–1900), however, jobs and organizations changed dramatically.[9] First, thanks to the availability of power (steam engines and later electricity) and numerous inventions, such as Darby's coke-smelting process and Cort's puddling and rolling process (both for making iron) and Hargreave's spinning jenny and Arkwright's water frame (both for spinning cotton), low-paid, unskilled laborers running machines began to replace high-paid, skilled artisans. Whereas artisans made entire goods by themselves by hand, this new production system was based on a division of labor: each worker, interacting with machines, performed separate, highly specialized tasks that were but a small part of all the steps required to make manufactured goods. Mass production was born as rope- and chain-driven assembly lines moved work to stationary workers who concentrated on performing one small task over and over again. While workers focused on their singular tasks, managers were needed to effectively coordinate the different parts of the production system and optimize its overall performance. Productivity skyrocketed at companies that understood this. For example, at Ford Motor Company, the time required to assemble a car dropped from 12.5 man hours to just 93 minutes.[10]

Second, instead of being performed in fields, homes, or small shops, jobs occurred in large, formal organizations where hundreds, if not thousands, of people worked under one roof.[11] In 1849, for example, with just 123 workers, Chicago Harvester (the predecessor of International Harvester) ran the largest factory in the United States. In 1870, the Pullman Company, a manufacturer of railroad sleeping cars, was the largest, with only 200 employees. Yet, by 1913, Henry Ford employed 12,000 employees in his Highland Park, Michigan factory alone. With the number of people working in manufacturing having quintupled from 1860 to 1890, and with individual factories employing so many workers under one roof, companies now had a strong need for disciplinary rules (to impose order and structure). For the first time, they needed managers who knew how to organize large groups, work with employees, and make good decisions.

Review 1: The Origins of Management

Management as a field of study may be just 125 years old, but management ideas and practices have actually been used since the beginning of recorded history. From the Sumerians in 5000 B.C. to sixteenth-century Europe, there are historical antecedents for each of the functions of management discussed in this textbook: planning, organizing, leading, and controlling. Despite these early examples of management ideas, there was no compelling need for managers until systematic changes in the nature of work and organizations occurred during the last two centuries. As work shifted from families to factories, from skilled laborers to specialized, unskilled laborers, from small, self-organized groups to large factories employing thousands under one roof, and from unique, small batches of production to large standardized mass production, managers were needed to impose order and structure, to motivate and direct

large groups of workers, and to plan and make decisions that optimized overall company performance by effectively coordinating the different parts of organizational systems.

The Evolution of Management

Before 1880, business educators taught basic bookkeeping and secretarial skills, and no one published books or articles about management.[12] Over the next 25 years, however, things changed dramatically. In 1881, Joseph Wharton gave the University of Pennsylvania $100,000 to establish a department to educate students for careers in management. By 1911, 30 business schools, including those at Harvard, the University of Chicago, and the University of California, had been established to teach managers how to run businesses.[13] In 1886, Henry Towne, president of the Yale and Towne Manufacturing Company, presented his ideas about management to the American Society of Engineers. In his talk entitled "The Engineer as Economist," he emphasized that managing people and work processes was just as important as engineering work, which focused on machines.[14] Towne also argued that management should be recognized as a separate field of study with its own professional associations, journals, and literature where management ideas could be exchanged and developed. Today, because of the forethought and efforts of Joseph Wharton and Henry Towne, if you have a question about management, you can turn to dozens of academic journals (such as The Academy of Management's *Journal* or *Review*, *Administrative Science Quarterly*, the *Strategic Management Journal*, and the *Journal of Applied Psychology*), hundreds of business school and practitioner journals (such as *Harvard Business Review, Sloan Management Review*, and the *Academy of Management Executive*), and thousands of books and articles. In the next four sections, you will learn about other important contributors to the field of management and how their ideas shaped our current understanding of management theory and practice.

After reading the next four sections, which review the different schools of management thought, you should be able to

2 explain the history of scientific management.
3 discuss the history of bureaucratic and administrative management.
4 explain the history of human relations management.
5 discuss the history of operations, information, systems, and contingency management.

2 SCIENTIFIC MANAGEMENT

Before scientific management, organizational decision making could best be described as "seat-of-the-pants." Decisions were made haphazardly without any systematic study, thought, or collection of information. Customer orders were transmitted verbally from sales representatives to shop floor supervisors. They were not written down. If the "managers" hired by the company founder or owner decided that workers should work twice as fast, little or no thought was given to worker motivation. If workers resisted, "managers" often resorted to physical beatings to get workers to work faster, harder, or longer. In general, with no incentives for "managers" to cooperate with workers and vice versa, managers and workers gamed the system trying to systematically take advantage of each other. Likewise, nothing was standardized. Each worker did the same job in his or her own way with different methods and different tools.

In short, there were no procedures to standardize operations, no standards to judge whether performance was good or bad, and no follow-up to determine if productivity or quality actually improved when changes were made.[15]

This all changed, however, with the advent of **scientific management**, which, in contrast to the unsystematic "seat-of-the-pants" approach, thoroughly studied and tested different work methods to identify the best, most efficient ways to complete a job.

scientific management
Thoroughly studying and testing different work methods to identify the best, most efficient way to complete a job.

Let's find out more about scientific management by learning about **2.1 Frederick W. Taylor, the father of scientific management; 2.2 Frank and Lillian Gilbreth and motion studies;** and **2.3 Henry Gantt and his Gantt charts.**

2.1 Father of Scientific Management: Frederick W. Taylor

Frederick W. Taylor (1856–1915), the "father of scientific management," began his career as a worker at Midvale Steel Company. He was later promoted to patternmaker, supervisor, and then chief engineer.

At Midvale, Taylor was deeply affected by his three-year struggle to get the men who worked for him to do, as he called it, "a fair day's work." Taylor, who had worked alongside the men as a coworker before becoming their boss, said, "We who were the workmen of that shop had the quantity output carefully agreed upon for everything that was turned out in the shop. We limited the output to about, I should think, one-third of what we could very well have done." Taylor explained that as soon as he became the boss, "the men who were working under me . . . knew that I was onto the whole game of **soldiering**, or deliberately restricting output."[16] When Taylor told his workers, "I have accepted a job under the management of this company and I am on the other side of the fence . . . I am going to try to get a bigger output," the workers responded, "We warn you, Fred, if you try to bust any of these rates [a **rate buster** was someone who worked faster than the group] we will have you over the fence in six weeks."[17]

soldiering
When workers deliberately slow their pace or restrict their work outputs.

rate buster
A group member whose work pace is significantly faster than the normal pace in his or her group.

Over the next three years, Taylor tried everything he could think of to improve output. By doing the job himself, he showed workers that it was possible to produce more output. He hired new "intelligent" workers and trained them himself, hoping they would produce more. But they would not because of "very heavy social pressure" from the other workers. Pushed by Taylor, the workers began breaking their machines so that they couldn't produce. Taylor responded by fining them every time they broke a machine and for any violation of the rules, no matter how small, such as being late to work. Tensions became so severe that some of the workers threatened to shoot him. Looking back at the situation, Taylor reflected, "It is a horrid life for any man to live, not to be able to look any workman in the face all day long without seeing hostility there and feeling that every man around one is his virtual enemy." He said, "I made up my mind either to get out of the business entirely and go into some other line of work, or to find some remedy for this unbearable condition."[18] The remedy that Taylor eventually developed was scientific management.

Frederick Taylor is known today as the "father of scientific management." One of his many contributions to modern management is the common practice of giving employees rest breaks throughout the day.

First:	Develop a science for each element of a man's work, which replaces the old rule-of-thumb method.
Second:	Scientifically select and then train, teach, and develop the workman, whereas in the past he chose his own work and trained himself as best he could.
Third:	Heartily cooperate with the men so as to insure all of the work being done is in accordance with the principles of the science which has been developed.
Fourth:	There is an almost equal division of the work and the responsibility between the management and the workmen. The management take over all the work for which they are better fitted than the workmen, while in the past almost all of the work and the greater part of the responsibility were thrown upon the men.

Source: F. W. Taylor, *The Principles of Scientific Management* (New York: Harper, 1911).

Exhibit 2.2
Taylor's Four Principles of Scientific Management

Taylor, who once described scientific management as "seventy-five percent science and twenty-five percent common sense," emphasized that the goal of scientific management was to use systematic study to find the "one best way" of doing each task. To do that, managers must follow the four principles shown in Exhibit 2.2.[19] First, "develop a science" for each element of work. Study it. Analyze it. Determine the "one best way" to do the work. For example, one of Taylor's controversial proposals at the time was to give rest breaks to factory workers doing physical labor. We take morning, lunch, and afternoon breaks for granted, but in Taylor's day, factory workers were expected to work without stopping.[20] When Taylor said that breaks would increase worker productivity, no one believed him. Nonetheless, through systematic experiments, he showed that workers receiving frequent rest breaks were able to greatly increase their daily output.

Second, scientifically select, train, teach, and develop workers to help them reach their full potential. Before Taylor, supervisors often hired on the basis of favoritism and nepotism. Who you knew was often more important than what you could do. By contrast, Taylor instructed supervisors to hire "first class" workers on the basis of their aptitude to do a job well. In one of the first applications of this principle, physical reaction times were used to select bicycle ball bearing inspectors who had to be able to examine and reject poor-quality ball bearings as fast as they were produced on a production line. For similar reasons, Taylor also recommended that companies train and develop their workers—a rare practice at the time.

Third, cooperate with employees to ensure implementation of the scientific principles. Labor unrest was widespread at the time; the number of labor strikes against companies doubled between 1893 and 1904. As Taylor knew from personal experience, more often than not workers and management viewed each other as the enemy. Taylor's advice ran contrary to the common wisdom of the day. He said, "The majority of these men believe that the fundamental interests of employees and employers are necessarily antagonistic. Scientific management, on the contrary, has for its very foundation the firm conviction that the true interests of the two are one and the same; that prosperity for the employer cannot exist through a long term of years unless it is accompanied by prosperity for the employee and vice versa; and that it is possible to give the workman what he most wants—high wages—and the employer what he wants—a low labor cost—for his manufactures."[21]

The fourth principle of scientific management was to divide the work and the responsibility equally between management and workers. Prior to Taylor, workers alone were held responsible for productivity and performance. But, said Taylor, "Almost every act of the workman should be preceded by one or more preparatory acts of the management which enable him to do his work better and quicker than he otherwise could. And each man should daily be taught by and receive the most friendly help from those who are over him, instead of being, at the one extreme, driven or coerced by his bosses, and at the other left to his own unaided devices."[22]

Above all, Taylor felt these principles could be used to determine a "fair day's work," that is, what an average worker could produce at a reasonable pace, day in and day out. Once that was determined, it was management's responsibility to pay workers fairly for that "fair day's work." In essence, Taylor was trying to align management and employees so that what was good for employees was also good for management. In this way, he felt, workers and managers could avoid the conflicts that he had experienced at Midvale Steel. And one of the best ways, according to Taylor, to align management and employees was to use incentives to motivate workers. As Taylor wrote:

In order to have any hope of obtaining the initiative of his workmen the manager must give some special incentive to his men beyond that which is given to the average of the trade. This incentive can be given in several different ways, as, for example, the hope of rapid promotion or advancement; higher wages, either in the form of generous piecework prices or of a premium or bonus of some kind for good and rapid work; shorter hours of labor; better surroundings and working conditions than are ordinarily given, etc., and, above all, this special incentive should be accompanied by that personal consideration for, and friendly contact with, his workmen which comes only from a genuine and kindly interest in the welfare of those under him. It is only by giving a special inducement or "incentive" of this kind that the employer can hope even approximately to get the "initiative" of his workmen.[23]

Although Taylor remains a controversial figure among some academics, nearly a century later it is inarguable that his key ideas have stood the test of time.[24] These include using systematic analysis to identify the best methods; scientifically selecting, training, and developing workers; promoting cooperation between management and labor; developing standardized approaches and tools; setting specific tasks or goals and then rewarding workers with financial incentives; and giving workers shorter work hours and frequent breaks. In fact, his ideas are so well accepted and widely used that we take most of them for granted. As eminent management scholar Edwin Locke said, "The point is not, as is often claimed, that he was 'right in the context of his time,' but is now outdated, but that *most of his insights are still valid today*."[25]

2.2 Motion Studies: Frank and Lillian Gilbreth

The husband and wife team Frank and Lillian Gilbreth are best known for their use of motion studies to simplify work, but they also made significant contributions to the employment of handicapped workers and industrial psychology. Like Frederick Taylor, their early experiences significantly shaped their interests and contributions to management.

Though admitted to MIT, Frank Gilbreth (1868–1924) began his career as an apprentice bricklayer. While learning the trade, he noticed the bricklayers using three different sets of motions—one to teach others how to lay bricks, a second to work at a slow pace, and a third to work at a fast pace.[26] Wondering which was best, he studied the various approaches and began eliminating unnecessary motions. For example, by designing a stand that could be raised to waist height, he eliminated the need to bend over to pick up each brick. Turning to grab a brick was faster and easier than bending down. By having lower-paid workers place all the bricks with their most attractive side up, bricklayers didn't waste time turning a brick over to find it. By mixing a more consistent mortar, bricklayers no longer had to tap each brick numerous times to put it in the right position. Together, Gilbreth's improvements raised productivity from 120 to 350 bricks per hour and from 1,000 bricks to 2,700 bricks per day.

As a result of his experience with bricklaying, Gilbreth and his wife Lillian's developed a long-term interest in using motion study to simplify work,

improve productivity, and reduce the level of effort required to safely perform a job. Indeed, Frank Gilbreth said, "The greatest waste in the world comes from needless, ill-directed, and ineffective motions."[27] The Gilbreths' motion study, however, is different from Frederick W. Taylor's time study.[28] Taylor developed time study to put an end to soldiering and to determine what could be considered a fair day's work. **Time study** worked by timing how long it took a "first-class man" to complete each part of his job. After allowing for rest periods, a standard time was established, and a worker's pay would increase or decrease depending on whether the worker exceeded or fell below that standard. By contrast, **motion study**, as we saw in Frank Gilbreth's analysis of bricklaying, broke each task or job into separate motions and then eliminated those that were unnecessary or repetitive. Because many motions were completed very quickly, the Gilbreths used motion-picture films, then a relatively new technology, to analyze jobs. Most film cameras, however, were hand-cranked and thus variable in their film speed, so Frank Gilbreth invented the micro chronometer, a large clock that could record time to 1/2,000th of a second. By placing the micro chronometer next to the worker in the camera's field of vision and attaching a flashing strobe light to the worker's hands to better identify the direction and sequence of key movements, the Gilbreths could use film to detect and precisely time even the slightest, fastest movements. Motion study typically yielded production increases of 25 to 300 percent.[29] It was even used in hospitals to clearly identify the large amount of time that surgeons wasted looking for the next surgical instrument they needed. Frank Gilbreth improved this process by making a nurse responsible for organizing, retrieving, and handing surgical instruments to surgeons, a process still in use today.[30]

time study
Timing how long it takes good workers to complete each part of their jobs.

motion study
Breaking each task or job into its separate motions and then eliminating those that are unnecessary or repetitive.

One of the Gilbreths' most overlooked accomplishments was the critical role they played in rehabilitating and employing handicapped workers.[31] After World War I, there were 13 million wounded and handicapped soldiers in the United States and Europe. Frank Gilbreth worried, "What is to be done with the millions of cripples, when their injuries have been remedied as far as possible, and when they are obliged to become again a part of the working community?"[32] Sensitive to this issue because of Frank's recovery from a rheumatism attack that had left him paralyzed from the neck down, the Gilbreths applied motion study to identify the kinds of tasks that handicapped workers could effectively perform. Nearly 75 years before the Americans with Disabilities Act became law (see Chapter 12 for more information), the Gilbreths argued that the government, employers, and engineers had an important role to play in employing handicapped workers. The government's job, they said, was to provide vocational training. Indeed, in 1918, the U.S. Congress passed the Vocational Rehabilitation Act, adopting most of the Gilbreths' key recommendations. Employers, they said, should identify jobs that handicapped persons could perform. To help employers do this, the Gilbreths created a large slide show of pictures documenting the hundreds of ways in which the handicapped could effectively perform jobs. Last, according to the Gilbreths, engineers had a responsibility to adapt and design machines so that handicapped workers could use them.

Lillian Gilbreth (1878–1972) was an important contributor to management as well. She was the first woman to receive a Ph.D. in Management, as well as the first woman to become a member of the Society of Industrial Engineers and the American Society of Mechanical Engineers. When Frank died in 1924, she continued the work of their management consulting company (which they had shared for over a dozen years) on her own. Lillian, who was concerned with the human side of work, was one of the first contributors to industrial psychology, originating ways to improve office communication, incentive programs, job satisfaction, and management training. Her work also convinced the government to enact laws regarding workplace safety, ergonomics, and child labor.

2.3 Charts: Henry Gantt

Henry Gantt (1861–1919) was first a protégé and then an associate of Frederick Taylor. Gantt is best known for the Gantt chart, but he also made significant contributions to management with respect to pay-for-performance plans and the training and development of workers. As shown in Exhibit 2.3, a **Gantt chart**, which shows time in various units on the *x*-axis and tasks on the *y*-axis, visually indicates what tasks must be completed at which times in order to complete a project. For example, Exhibit 2.3 shows that to start construction on a new company headquarters by the week of November 18, the following tasks must be completed by the following dates: architectural firm selected by October 7, architectural planning done by November 4, permits obtained from the city by November 11, site preparation finished by November 18, and loans and financing finalized by November 18. Though simple and straightforward, Gantt charts were revolutionary in the era of "seat-of-the-pants" management because of the detailed planning information they provided to managers. As Gantt wrote, "By using the graphical forms [the Gantt chart] its value is very much increased, for the general appearance of the sheet is sufficient to tell how closely the schedule is being lived up to; in other words, whether the plant is being run efficiently or not." Gantt said, "Such sheets show at a glance where the delays occur, and indicate what must have our attention in order to keep up the proper output." Today, the use of Gantt charts is so widespread that nearly all project management software and computer spreadsheets have the capability to create charts that track and visually display the progress being made on a project.

Gantt chart
A graphical chart that shows which tasks must be completed at which times in order to complete a project or task.

Gantt, who was much more sympathetic toward workers than Frederick Taylor, introduced a significant change to Taylor's well-known piece-rate reward system. Unlike Taylor's system, in which payment was completely dependent on production—if you produced at substandard levels, you got substandard pay—Gantt's task and bonus system did not punish workers for not achieving higher levels of production. Workers who produced more received a daily bonus, but those who didn't simply received their standard daily pay. The key, according to

Exhibit 2.3
Gantt Chart for Starting Construction on a New Headquarters

Gantt, was that his task and bonus system didn't punish workers for lower production as they took time to learn how to increase their production efficiency. Production usually doubled under Gantt's system.[33]

Finally, Gantt, along with Taylor, was one of the first to strongly recommend that companies train and develop their workers.[34] In his work with companies, he found that workers achieved their best performance levels if they were trained first. At the time, however, supervisors, fearing that they could lose their jobs to more knowledgeable workers, were reluctant to teach workers what they knew. Gantt overcame the supervisors' resistance by rewarding them with bonuses for properly training all of their workers. Said Gantt, "This is the first recorded attempt to make it in the financial interest of the foreman to teach the individual worker, and the importance of it cannot be overestimated, for it changes the foreman from a driver of men to their friend and helper."[35] Thus, Gantt's approach to training was straightforward: "(1) a scientific investigation in detail of each piece of work, and the determination of the best method and the shortest time in which the work can be done. (2) A teacher capable of teaching the best method and the shortest time. (3) Reward for both teacher and pupil when the latter is successful."[36]

Review 2: Scientific Management

In contrast to "seat-of-the-pants" management, scientific management recommended studying and testing different work methods to identify the best, most efficient ways to complete a job. According to Frederick W. Taylor, the "father of scientific management," managers should follow four scientific management principles. First, study each element of work to determine the "one best way" to do it. Second, scientifically select, train, teach, and develop workers to reach their full potential. Third, cooperate with employees to ensure implementation of the scientific principles. Fourth, divide the work and the responsibility equally between management and workers. Above all, Taylor felt these principles could be used to align managers and employees by determining a "fair day's work," what an average worker could produce at a reasonable pace, and "a fair day's pay," what management should pay workers for that effort. Taylor felt that incentives were one of the best ways to align management and employees.

The husband and wife team of Frank and Lillian Gilbreth are best known for their use of motion studies to simplify work. Whereas Taylor used time study to determine "a fair day's work," based on how long it took a "first-class man" to complete each part of his job, Frank Gilbreth used film cameras and micro chronometers to conduct motion study to improve efficiency by categorizing and eliminating unnecessary or repetitive motions. The Gilbreths also made significant contributions to the employment of handicapped workers, encouraging the government to rehabilitate them, employers to identify jobs that they could perform, and engineers to adapt and design machines they could use. Lillian Gilbreth, one of the first contributors to industrial psychology, originated ways to improve office communication, incentive programs, job satisfaction, and management training. She also convinced the government to enact laws regarding workplace safety, ergonomics, and child labor. Henry Gantt is best known for the Gantt chart, which graphically indicates when a series of tasks must be completed to perform a job or project, but he also developed ideas regarding pay-for-performance plans (where workers were rewarded for producing more, but were not punished if they didn't) and worker training (all workers should be trained and their managers should be rewarded for training them).

3 BUREAUCRATIC AND ADMINISTRATIVE MANAGEMENT

The field of scientific management, which quickly developed in the United States between 1895 and 1920, focused on improving the efficiency of manufacturing facilities and their workers. At about the same time, equally important ideas

were developing in Europe. German sociologist Max Weber's ideas about bureaucratic management, which presented a new way to run entire organizations, were published in *The Theory of Economic and Social Organization* in 1922. Henri Fayol, an experienced French CEO, published his ideas about administrative management, including how and what managers should do in their jobs, in *General and Industrial Management* in 1916. Though developed at the same time as scientific management, the ideas of Weber and Fayol would not begin to influence American ideas about management until after World War II, when their books were translated into English and published in the United States in 1947 and 1949, respectively.

Let's find out more about Weber's and Fayol's contributions to management by learning about **3.1 bureaucratic management** and **3.2 administrative management**.

3.1 Bureaucratic Management: Max Weber

Today, when we hear the term *bureaucracy*, we think of inefficiency and "red tape," incompetence and ineffectiveness, and rigid administrators blindly enforcing nonsensical rules. When German sociologist Max Weber (1864–1920) first proposed the idea of bureaucratic organizations, however, monarchies and patriarchies, not bureaucracies, were associated with these problems. In monarchies, where kings, queens, sultans, and emperors ruled, and patriarchies, where a council of elders, wise men, or male heads of extended families ruled, the top leaders typically achieved their positions by virtue of birthright. For example, when the queen died, her oldest son became king, regardless of his intelligence, experience, education, or desire. Likewise, promotion to prominent positions of authority in monarchies and patriarchies was based on who you knew, who you were (heredity), or ancient rules and traditions. In short, for much of humankind's history, people often rose to positions of wealth and power because of family, political connections, or personal loyalty.

It was against this historical background of monarchical and patriarchic rule that Weber proposed the then new idea of bureaucracy. *Bureaucracy* comes from the French word *bureaucratie*. Since *bureau* means desk or office and *cratie* or *cracy* means to rule, *bureaucracy* literally means to rule from a desk or office. According to Weber, however, **bureaucracy** is "the exercise of control on the basis of knowledge."[37] So, in a bureaucracy, rather than ruling by virtue of favoritism, or personal or family connections, people would lead by virtue of their rational-legal authority—in other words, their knowledge, expertise, or experience. Furthermore, the aim of bureaucracy is to achieve an organization's goals in the most efficient way possible.

bureaucracy
The exercise of control on the basis of knowledge, expertise, or experience.

Exhibit 2.4 shows the seven elements that, according to Weber, characterize bureaucracies. First, instead of hiring people because of their family or political connections, or personal loyalty, they should be hired because their technical training or education qualifies them to do their jobs well. Second, along the same lines, promotion within the company would no longer be based on who you knew or who you were (heredity), but on your experience or achievements. And to further limit the influence of personal connections in the promotion process, managers, rather than organizational owners, should decide who gets promoted. Third, each position or job is part of a chain of command that clarifies who reports to whom throughout the organization. Those higher in the chain of command have the right, if they so choose, to give commands, take action, and make decisions concerning activities occurring anywhere below them in the chain. Unlike many monarchies or patriarchies, however, those lower in the chain of command are protected by a grievance procedure that gives them the right to appeal the decisions of those in higher positions. Fourth, to increase efficiency and effectiveness, tasks and responsibilities are separated and assigned to those best qualified to complete them. Furthermore, authority

Qualification-based hiring:	Employees are hired on the basis of their technical training or educational background.
Merit-based promotion:	Promotion is based on experience or achievement. Managers, not organizational owners, decide who is promoted.
Chain of commands:	Each job occurs within a hierarchy, the chain of command, in which each position reports and is accountable to a higher position. A grievance procedure and a right to appeal protect people in lower positions.
Division of labor:	Tasks, responsibilities, and authority are clearly divided and defined.
Impartial application of rules and procedures:	Rules and procedures apply to all members of the organization and will be applied in on impartial manner, regardless of one's position or status
Recorded in writing:	All administrative decisions, acts, rules, or procedure will be recorded in writing.
Managers separate from owners:	The owners of an organization should not manage or supervise the organization.

Source: M. Weber, *The Theory of Economic and Social Organization,* trans. A. Henderson & T. Parsons (New York: The Free Press, 1947), 329-334.

Exhibit 2.4
Elements of Bureaucratic Organizations

is vested in positions, not people. If you move to a different job, your authority increases or decreases commensurate with the responsibilities of that job. And, to reduce confusion and conflict, the authority of each position or job is also clearly divided and defined. Fifth, because of his strong distaste for favoritism, Weber felt that an organization's rules and procedures should apply to all members, regardless of their position or status. Sixth, to ensure consistency and fairness over time and across different leaders and supervisors, all rules, procedures, and decisions should be recorded in writing. Finally, to reduce favoritism, "professional" managers rather than company owners, should manage or supervise the organization.

When viewed in historical context, Weber's ideas about bureaucracy represent a tremendous improvement in how organizations should be run. Fairness supplanted favoritism, the goal of efficiency replaced the goal of personal gain, and logical rules and procedures took the place of traditions or arbitrary decision making. Today, however, after more than a century of experience we recognize that bureaucracy has limitations as well. In bureaucracies, managers are supposed to influence employee behavior by fairly rewarding or punishing employees for compliance or noncompliance with organizational policies, rules, and procedures. In reality, however, most employees would argue that bureaucratic managers emphasize punishment for noncompliance much more than rewards for compliance. Ironically, bureaucratic management was created to prevent just this type of managerial behavior. By encouraging managers to apply well-thought-out rules, policies, and procedures impartially and consistently to everyone in the organization, bureaucratic control is supposed to make companies more efficient, effective, and fair. Perversely, as you'll read in Chapter 16 on control, it can sometimes have just the opposite effect. Managers who use bureaucratic control often put following the rules above all else. Another limitation of bureaucratically controlled companies is that due to their rule- and policy-driven decision making, they can be highly resistant to change and slow to respond to customers and competitors. Despite its advantages over monarchical and patriarchic organizational forms, even Weber recognized bureaucracy's limitations. He called it the "iron cage" and said, "Once fully established, bureaucracy is among those social structures which are the hardest to destroy."[38]

3.2 Administrative Management: Henri Fayol

Though his work was not translated and widely recognized in the United States until 1949, Frenchman Henri Fayol (1841–1925) was as important a contributor to the field of management as Frederick Taylor. Like Taylor and Frank and Lillian Gilbreth, Fayol's work experience significantly shaped his thoughts and

ideas about management. But, whereas Taylor's ideas changed companies from the shop floor up, Fayol's ideas, which were shaped by his experience as a managing director (CEO), generally changed companies from the board of directors down.[39] Fayol is best known for developing five functions of managers and 14 principles of management, as well as for his belief that management could and should be taught to others.

Like his father, Henri Fayol enrolled in France's National School of Mines, graduating with an engineering degree at the age of 19.[40] His first job as a mining engineer for the Commentry coal mine was spent learning how to contain and put out underground fires. In this job, he began the valuable habit of recording notes about actions or happenings that either improved or decreased the productivity of the mine and its workers.[41] For instance, he wrote this note to himself about the cause of a work stoppage that occurred when his boss, the managing director, was gone: "May 1861. The horse on the sixth level of the St. Edmund pits broke its leg this morning. I made out an order for its replacement. The stableman refused to accept the order because it did not bear the Director's signature. The Director was absent. No one was designated to replace him. Despite my entreaties, the stableman persisted in his refusal. He had express orders, he said [not to provide a replacement horse unless the managing director ordered]. The injured horse was not replaced and production at the sixth level was lost."[42] It's very possible that this experience helped him form the now widely accepted management principle that a manager's authority should equal his or her responsibility.[43] In other words, because he was responsible for the productivity and production of coal at the St. Edmund's pit, his boss, the managing director, should have given him the authority to take actions, such as signing for a replacement horse, commensurate with that responsibility (see Chapter 9 for more on delegation, authority, and responsibility).

It's likely, however, that the most formative events in Fayol's business career came during his 20 plus years as the managing director (CEO) of a vertically integrated steel company that owned several coal and iron ore mines and employed, 10,000 to 13,000 workers. Fayol was initially hired by the board of directors to shut the "hopeless" steel company down. The company was facing increased competition from English and German steel companies, which had lower costs, and from new steel mills in northern and eastern France, which were closer to major markets and thus could avoid the large shipping costs incurred by Fayol's company, which was located in central France.[44] In the five years before Fayol became CEO, production had dropped more than 60 percent, from 38,000 to 15,000 annual metric tons. The company had exhausted a key supply of coal needed for steel production, had already shut one steel mill down, and was losing money at another.[45] The company had quit paying dividends to shareholders and had no cash to invest in new technology, such as blast furnaces, that could lower its costs and increase productivity. Therefore, the board hired Fayol as CEO to quickly dissolve and liquidate the business. But, after "four months of reflection and study," he presented the board with a plan, backed by detailed facts and figures, to save the company.[46] With little to lose, the board agreed. Fayol then began the process of turning the company around by obtaining supplies of key resources, such as coal and iron ore; using research to develop new steel alloy products; carefully selecting key subordinates in research, purchasing, manufacturing, and sales and then delegating responsibility to them; and cutting costs by moving the company to a better location closer to key markets.[47] Looking back 10 years later, Fayol attributed his and the company's success to changes in management practices. He wrote, "When I assumed the responsibility for the restoration of Decazeville, I did not rely on my technical superiority. . . . I relied on my ability as an organizer [and my] skill in handling men (manoeuvrier des hommes)."[48] Fayol concluded, "With the same [coal] mines, the same [steel] mills, the same financial resources, the same markets, the same Board of Directors and the

same personnel, solely *with the application of a new way of running the company* [italics added], the firm experienced a rise [in its performance] comparable to its earlier decline."[49]

Based on his experience as a CEO, Fayol argued that "the success of an enterprise generally depends much more on the administrative ability of its leaders than on their technical ability."[50] And, as you learned in Chapter 1, Fayol argued that this means that if managers are to be successful, they need to perform five managerial functions or elements: planning, organizing, coordinating, commanding, and controlling.[51] Today, though, most Management textbooks have dropped the coordinating function and now refer to Fayol's commanding function as "leading." Consequently, Fayol's management functions are widely known as planning (determining organizational goals and a means for achieving them), organizing (deciding where decisions will be made, who will do what jobs and tasks, and who will work for whom), leading (inspiring and motivating workers to work hard to achieve organizational goals), and controlling (monitoring progress toward goal achievement and taking corrective action when needed). In addition, according to Fayol, effective management is based on the 14 principles in Exhibit 2.5.

Exhibit 2.5
Fayol's 14 Principles of Management

1. **Division of work:**	Increase production by dividing work so that each worker completes smaller tasks or job elements.
2. **Authority and responsibility:**	A manager's authority, which is the "right to give orders," should be commensurate with the manager's responsibility. However, organizations should enact controls to prevent managers from abusing their authority.
3. **Discipline:**	Clearly defined rules and procedures are needed at all organizational levels to ensure order and proper behavior.
4. **Unity of command:**	To avoid confusion and conflict, each employee should report to and receive orders from just one boss.
5. **Unity of direction:**	One person and one plan should be used in deciding the activities to be used to accomplish each organizational objective.
6. **Subordination of individual interests to the general interest:**	Employees must put the organization's interests and goals before their own.
7. **Remuneration:**	Compensation should be fair and satisfactory to both the employees and the organization; that is, don't overpay or underpay employees.
8. **Centralization:**	Avoid too much centralization or decentralization. Strike a balance depending on the circumstances and employees involved.
9. **Scalar chain:**	From the top to the bottom of an organization, each position is part of a vertical chain of authority in which each worker reports to just one boss. For the sake of simplicity, communication outside normal work groups or departments should follow the vertical chain of authority.
10. **Order:**	To avoid conflicts and confusion, order can be obtained by having a place for everyone and having everyone in their place; in other words, there should be no overlapping responsibilities.
11. **Equity:**	Kind, fair, and just treatment for all will develop devotion and loyalty. This does not exclude discipline, if warranted, and consideration of the broader general interest of the organization.
12. **Stability of tenure of personnel:**	Low turnover, meaning a stable work force with high tenure, benefits an organization by improving performance, lowering costs, and giving employees, especially managers, time to learn their jobs.
13. **Initiative:**	Because it is a "great source of strength for business," managers should encourage the development of initiative, the ability to develop and implement a plan, in others.
14. **Esprit de corps:**	Develop a strong sense of morale and unity among workers that encourages coordination of efforts.

Sources: H. Fayol, *General and Industrial Management* (London: Pittman & Sons, 1949); M. Fells, "Fayol Stands the Test of Time," *Journal of Management History* 6 (2000): 345–360; C. Rodrigues, "Fayol's 14 Principles of Management Then and Now: A Framework for Managing Today's Organizations Effectively," *Management Decision* 39 (2001): 880–889.

Finally, along with Joseph Wharton, Fayol was one of the first to argue that management could and should be taught to others. In short, Fayol believed that the principles of management could be taught in colleges and universities and that managers are not born but can be made through a combination of education and experience.

Review 3: Bureaucratic and Administrative Management

Today, when we hear *bureaucracy*, we think of inefficiency and "red tape." Yet, according to German sociologist Max Weber, bureaucracy, that is, running organizations on the basis of knowledge, fairness, and logical rules and procedures, would accomplish organizational goals much more efficiently than monarchies and patriarchies, where decisions were made on the basis of personal or family connections, personal gain, and arbitrary decision making. Bureaucracies are characterized by seven elements: qualification-based hiring; merit-based promotion; chain of command; division of labor; impartial application of rules and procedures; recording rules, procedures, and decisions in writing; and separating managers from owners. Nonetheless, bureaucracies are often inefficient and can be highly resistant to change.

The Frenchman Henri Fayol, whose ideas were shaped by his 20 plus years of experience as a CEO, is best known for developing five management functions (planning, organizing, coordinating, commanding, and controlling) and 14 principles of management (division of work, authority and responsibility, discipline, unity of command, unity of direction, subordination of individual interests to the general interest, remuneration, centralization, scalar chain, order, equity, stability of tenure of personnel, initiative, and esprit de corps). He is also known for his belief that management could and should be taught to others.

4 HUMAN RELATIONS MANAGEMENT

As we have seen, scientific management focused on improving the efficiency of manufacturing facilities and their workers; bureaucratic management focused on using knowledge, fairness, and logical rules and procedures to increase the efficiency of the entire organization; and administrative management focused on how and what managers should do in their jobs. In contrast, the human relations approach to management focused on the psychological and social aspects of work. Under the human relations management approach, people were more than just extensions of machines; they were valuable organizational resources whose needs were important and whose efforts, motivation, and performance were affected by the work they did and their relationships with their bosses, coworkers, and work groups. In other words, according to human relations management, efficiency alone is not enough to produce organizational success. Success also depends on treating workers well.

Let's find out more about human relations management by learning about **4.1 Mary Parker Follett's theories of constructive conflict and coordination; 4.2 Elton Mayo's Hawthorne Studies;** and **4.3 Chester Barnard's theories of cooperation and acceptance of authority.**

4.1 Constructive Conflict and Coordination: Mary Parker Follett

Mary Parker Follett (1868–1933) was a social worker with a degree in political science who, in her 50s, after 25 years of working with schools and nonprofit organizations, began lecturing and writing about management and working extensively as a consultant for business and government leaders in the United States and Europe. Although her contributions were overlooked for decades, perhaps because she was a woman or perhaps because they were so different, many of today's "new" management ideas can clearly be traced to her work.

Follett is known for developing ideas regarding constructive conflict and coordination. Constructive conflict, also called cognitive conflict, which is discussed in Chapter 5 on decision making and Chapter 10 on teams, is one of Follett's most important contributions. Unlike most people, then and now, who view conflict as bad, Follett believed that conflict could be beneficial. She said that conflict is "the appearance of difference, difference of opinions, of interests. For that is what conflict means—difference." She went on to say, "As conflict—difference—is here in this world, as we cannot avoid it, we should, I think, use it to work for us. Instead of condemning it, we should set it to work for us. Thus we shall not be afraid of conflict, but shall recognize that there is a destructive way of dealing with such moments and a constructive way."[52]

domination
An approach to dealing with conflict in which one party deals with the conflict by satisfying its desires and objectives at the expense of the other party's desires and objectives.

compromise
An approach to dealing with conflict in which both parties deal with the conflict by giving up some of what they want in order to reach agreement on a plan to reduce or settle the conflict.

integrative conflict resolution
An approach to dealing with conflict in which both parties deal with the conflict by indicating their preferences and then working together to find an alternative that meets the needs of both.

Follett believed that managers could deal with conflict in three ways: domination, compromise, and integration. She said, "**Domination**, obviously, is a victory of one side over the other. This is the easiest way of dealing with conflict, the easiest for the moment but not usually successful in the long run." "As for the second way of dealing with conflict, that of **compromise**, we understand [it] well, for it is the way we settle most of our controversies; each side gives up a little in order to have peace, or, to speak more accurately, in order that the activity which has been interrupted by the conflict may go on." Follett continued, "Yet no one really wants to compromise, because that means a giving up of something. Is there then any other method of ending conflict? There is a way beginning now to be recognized at least, and even occasionally followed: when two desires are *integrated*, that means that a solution has been found in which both desires have found a place that neither side has had to sacrifice anything." So, rather than one side dominating the other or both sides compromising, the point of **integrative conflict resolution** is to have both parties indicate their preferences and then work together to find an alternative that meets the needs of both. According to Follett, "Integration involves invention, and the clever thing is to recognize this, and not to let one's thinking stay within the boundaries of two alternatives which are mutually exclusive." Indeed, Follett's ideas about the positive use of conflict and an integrative approach to conflict resolution predate accepted thinking in the negotiation and conflict resolution literature by six decades (see the best-selling book *Getting to Yes: Negotiating Agreement without Giving In* by Roger Fisher, William Ury, and Bruce Patton).

Follett's writing on the role of coordination in organizations is another of her important contributions. According to Follett, there are four fundamental principles of organizations:

1. Coordination as reciprocal relating all the factors in a situation.
2. Coordination by direct contact of the responsible people concerned.
3. Coordination in the early stages.
4. Coordination as a continuing process.

Follett's first principle recognizes that most things that occur in organizations are interrelated. Make just one change in an organization, and other changes, some expected but some not, will occur. Cut costs, and quality may be affected. Change the raw ingredients used to make a product, and manufacturing procedures may no longer work. Marketing offers customers special incentives to buy more products, and operations has to work overtime to keep up with the increased demand. Accordingly, because of these interrelations, leaders at different levels and in different parts of the organization must coordinate their efforts to solve problems and produce the best overall outcomes in an integrative way. In short, managers cannot manage their part of the organization while ignoring its other parts. What each manager does affects other parts of the organization and vice versa.

Follett explains her second principle, coordination by direct contact of the people concerned, and her third principle, coordination in the early stages, this

way: "Direct contact must begin in the earliest stages of the process. . . . If the heads of departments confront each other with finished policies, agreement will be found difficult. . . . But if these heads meet while they are forming their policies, meet and discuss the questions involved, a successful co-relation is far more likely to be reached. Their thinking has not become crystallized. They can still modify one another."[53] In other words, better outcomes will be achieved if the people affected by organizational issues and problems meet early and directly to address them. Working with those involved or affected will produce more effective solutions than will isolating or ignoring them.

With respect to her fourth principle, coordination as a continuing process, Follett said: "It is a fallacy to think that we can solve problems—in any final sense. The belief that we can do so is a drag upon our thinking. What we need is a process for meeting problems. When we think we have solved one, well, by the very process of solving, new elements or forces come into the situation and you have a new problem on your hands to be solved." Consequently, there is always a need for early, integrative coordination of the people affected by organizational situations, problems, or issues. The need for coordination never goes away.

Exhibit 2.6 summarizes, in Follett's own words, her contributions to management regarding power ("with" not "over" others), the giving of orders (discussing instructions and resentment), authority (flowing from job knowledge and experience, not position), leadership (that leaders make the team and that aggressive, dominating leaders may be harmful), coordination, and control (should be based on facts, information, and coordination). In the end, Follett's contributions added significantly to our understanding of the human, social, and psychological sides of management. Peter Parker, the former chairman of the London School of Economics, said about Follett: "People often puzzle about who is the father of management. I don't know who the father was, but I have no doubt about who was the mother."[54]

4.2 Hawthorne Studies: Elton Mayo

Australian-born Elton Mayo (1880–1948) is best known for his role in the famous Hawthorne Studies at the Western Electric Company. His ideas became popular during the early twenthieth century when labor unrest, dissatisfaction, and protests (some of them violent) were widespread in the United States, Europe, and Asia. In 1919 alone, for example, more than four million American workers went on strike.[55] Working conditions contributed to the unrest. Millions of workers in large factories toiled at boring, repetitive, unsafe jobs for low pay. Employee turnover was high and absenteeism was rampant. With employee turnover approaching 380 percent in his automobile factories, Henry Ford had to double the daily wage of his manufacturing workers from $2.50, the going wage at the time, to $5.00 to keep enough workers at their jobs. Workers joined labor unions to force companies to improve their pay and working conditions. In 1913, the federal government created the U.S. Department of Labor "to foster, promote and develop the welfare of working people, to improve their working conditions and to enhance their opportunities for profitable employment." In 1935, Congress passed the National Labor Relations Act (also known as the Wagner Act), which gave workers the legal right to form unions and collectively bargain with their employers, but prevented companies from engaging in unfair labor practices to "bust" unions. In this historical context, Mayo's work on the Hawthorne Studies proved highly relevant as managers looked for ways to increase productivity and also to improve worker satisfaction and working conditions.[56]

The Hawthorne Studies were conducted in several stages between 1924 and 1932 at a Western Electric plant in Chicago, Illinois. Although Mayo didn't join

Constructive conflict	• "As conflict—difference—is here in this world, as we cannot avoid it, we should, I think, use it to work for us. Instead of condemning it, we should set it to work for us."
Power	• "Power might be defined as simply the ability to make things happen, to be a causal agent, to initiate change." • "It seems to me that whereas power usually means *power-over*, the power of some person or group over some other person or group, it is possible to develop the conception of *power-with*, a jointly developed power, a co-active, not a coercive power."
The giving of orders	• "Probably more industrial trouble has been caused by the manner in which orders have been given than in any other way." • "But even if instructions are properly framed, are not given in an overbearing manner, there are many people who react violently against anything that they feel is a command. It is often the command that is resented, not the thing commanded." • "An advantage of not exacting blind obedience, of discussing your instructions with your subordinates, is that if there is any resentment, any come-back, you get it out into the open, and when it is in the open you can deal with it."
Authority	• "Indeed there are many indications in the present reorganization of industry that we are beginning to rid ourselves of the over and under idea, that we are coming to a different conception of authority, many indications that there is an increasing tendency to let the job itself, rather than the position occupied in a hierarchy, dictate the kind and amount of authority." • "Authority should go with knowledge and experience, that is where obedience is due, no matter whether it is up the line or down."
Leadership	• "Of the greatest importance is the ability to grasp a total situation. . . . Out of a welter of facts, experience, desires, aims, the leader must find the unifying thread. He must see a whole, not a mere kaleidoscope of pieces. . . . The higher up you go, the more ability you have to have of this kind." • "The leader makes the team. This is pre-eminently the leadership quality—the ability to organize all the forces there are in an enterprise and make them serve a common purpose." • "[It is wrong to assume] that you cannot be a good leader unless you are aggressive, masterful, dominating. But I think not only that these characteristics are not the qualities essential to leadership but, on the contrary, that they often militate directly against leadership."
Coordination	• "One, which I consider a very important trend in business management is a system of cross-functioning between the different departments. . . . Each department is expected to get in touch with certain others." • "Many businesses are now organized in such a way that you do not have an ascending and descending ladder of authority. You have a degree of cross-functioning, of inter-relation of departments, which means a horizontal rather than a vertical authority." • "The most important thing to remember about unity is—that there is no such thing. There is only unifying. You cannot get unity and expect it to last a day—or five minutes. Every man in a business should be taking part in a certain process and that process is unifying."
Control	• "Control is coming more and more to mean fact-control rather than man-control." • "Central control is coming more and more to mean the co-relation of many controls rather than a superimposed control."

Source: Mary Parker Follett, *Mary Parker Follett—Prophet of Management: A Celebration of Writings from the 1920s*, ed. P. Graham (Boston: Harvard Business School Press, 1995).

Exhibit 2.6
Some of Mary Parker Follett's Key Contributions to Management

the studies until 1928, he played a significant role thereafter, writing about the results in his book, *The Human Problems of an Industrial Civilization*.[57] The first stage of the Hawthorne Studies investigated the effects of lighting levels and incentives on employee productivity in the Relay Test Assembly Room, where workers took approximately a minute to put "together a coil, armature, contact springs, and insulators in a fixture and secure the parts by means of four machine screws."[58] Two groups of six experienced female workers, five to do the work and one to supply needed parts, were separated from the main part of the factory by a 10-foot partition and placed at a standard work bench with the necessary parts and tools. Over the next five years, the experimenters introduced various levels and combinations of lighting, financial incentives, and rest pauses (work breaks) to study the effect on productivity. Curiously, however, whether they increased or decreased the lighting, paid workers based on individual production or group production, or increased or decreased the number and length of rest pauses, production levels increased. In fact, Mayo and his fellow researchers were surprised that production steadily increased from 2,400 relays per day at the beginning of the study to 3,000 relays per day five years later. The question, however, was why?

Although Mayo's studies used several variables, like lighting and incentives to increase productivity, it turned out that productivity increased no matter what changes were made. Mayo concluded that paying more attention to the workers and the development of the workers into a cohesive group produced higher levels of productivity and job satisfaction.

Mayo and his colleagues eventually concluded that two things accounted for the results. First, substantially more attention was paid to these workers than to workers in the rest of the plant. Mayo wrote, "Before every change of program [in the study], the group is consulted. Their comments are listened to and discussed; sometimes their objections are allowed to negate a suggestion. The group unquestionably develops a sense of participation in the critical determinations and becomes something of a social unit."[59]

The "Hawthorne Effect" cannot be understood, however, without giving equal importance to the "social units," which became intensely cohesive groups. (For years, the "Hawthorne Effect" has been *incorrectly* defined as increasing productivity by paying more attention to workers.[60]) Mayo said, "What actually happened was that six individuals became a team and the team gave itself wholeheartedly and spontaneously to cooperation in the experiment. The consequence was that they felt themselves to be participating freely and without afterthought, and were happy in the knowledge that they were working without coercion from above or limits from below."[61] Together, the increased attention from management and the development of a cohesive work group led to significantly higher levels of job satisfaction *and* productivity. Mayo and his research colleagues concluded:[62]

- "There has been an important increase in contentment among the girls working in the test-room conditions."
- "There has been a decrease in absences of about 80 percent among the girls since entering the test-room group."
- "The changed working conditions have resulted in creating an eagerness on the part of the operators to come to work in the morning."
- "The operators have no clear idea as to why they are able to produce more in the test room; but as shown in the replies to the questionnaires . . . there is the feeling that better output is in some way related to the distinctly pleasanter, freer, and happier work conditions."

For the first time, human factors related to work were found to be more important than the physical conditions or design of the work. In short, workers' feelings and attitudes affected their work.

The next stage of the Hawthorne Studies was conducted in the Bank Wiring Room, where "the group consisted of nine wiremen, three solderers, and two inspectors. Each of these groups performed a specific task and collaborated with the other two in completion of each unit of equipment. The task consisted of setting up the banks of terminals side-by-side on frames, wiring the corresponding terminals from bank to bank, soldering the connections, and inspecting with a test set for short circuits or breaks in the wire. One solderman serviced the work of the three wireman."[63] In contrast to the results from the Relay Test Assembly Room where productivity increased no matter what the researchers did, productivity dropped in the Bank Wiring Room. Again, the question was why?

Interestingly, Mayo and his colleagues found that group effects were just as responsible for the decline in performance in the Bank Wiring Room as they were for the increased performance in the Relay Test Assembly Room. The difference was that the workers in the Bank Wiring Room had been an existing work group for some time and had already developed strong negative norms that governed their behavior. For instance, despite a group financial incentive for production, the group members decided that they would wire only 6,000 to 6,600 connections a day (depending on the kind of equipment they were wiring), well below the production goal of 7,300 connections that management had set for them. Individual workers who worked at a faster pace were socially ostracized from the group, or "binged," hit on the arm, until they slowed their work pace. Thus, the group's behavior was reminiscent of the soldiering that Frederick Taylor had observed. Mayo concluded, "Work [was] done in accord with the group's conception of a day's work; this was exceeded by only one individual who was cordially disliked."[64]

In the end, the Hawthorne Studies demonstrated that the workplace was more complex than previously thought, that workers were not just extensions of machines, and that financial incentives weren't necessarily the most important motivator for workers. By highlighting the crucial role, positive or negative, that groups, group norms, and group behavior play at work, Mayo strengthened Mary Parker Follett's point about reciprocal relating—make just one change in an organization and others, some expected and some unexpected, will occur. Thanks to Mayo and his colleagues and their work on the Hawthorne Studies, managers better understood the effect that group social interactions and employee satisfaction and attitudes had on individual and group performance.

4.3 Cooperation and Acceptance of Authority: Chester Barnard

Like Henri Fayol, Chester Barnard (1886–1961) had experiences as a top executive that shaped his views of management. Barnard began his career in 1909 as an engineer and translator for AT&T, becoming a general manager at Pennsylvania Bell Telephone in 1922 and then president of New Jersey Bell in 1927.[65] Furthermore, like Fayol's views, Barnard's ideas, published in his classic book, *The Functions of the Executive*, influenced companies from the board of directors down. Barnard is best known for his ideas about cooperation, the executive functions that promote it, and the acceptance of authority.

organization
A system of consciously coordinated activities or forces created by two or more people.

In *The Functions of the Executive*, Barnard proposed a comprehensive theory of cooperation in formal organizations. In fact, he defines an **organization** as a "system of consciously coordinated activities or forces of two or more persons."[66] In other words, "organization" occurs whenever two people work

together for some purpose. Thus, organization occurs when classmates work together to complete a class project, when Habitat for Humanity volunteers donate their time to build a house, and when managers work with subordinates to reduce costs, improve quality, or increase sales. Why did Barnard place so much emphasis on cooperation? Because, he said, it is the "abnormal, not the normal, condition." "Failure to cooperate, failure of cooperation, failure of organization, disorganization, disintegration, destruction of organization—and reorganization—are characteristic facts of human history."[67]

Barnard argued that managers can gain others' cooperation by completing three executive functions: securing essential services from individuals, formulating an organization's purpose and objectives, and providing a system of communication. By "securing essential services from individuals," Barnard meant that managers must find ways to encourage workers to *willingly* cooperate with each other and management to achieve organizational goals. According to Barnard, managers can gain workers' willing cooperation by offering them *material incentives*, such as money or tangible rewards; *nonmaterial incentives*, such as recognition, prestige, personal power, improved working conditions, or satisfaction of personal ideals or needs; and *associational incentives*, such as the chance to work with people they like or to be more directly involved or associated with key events or processes in the organization.[68]

By "formulating an organization's purpose and objectives," top executives unify people in the company by making clear what needs to be accomplished. If the organization's purpose is clear, then each person in each job at each level of the company should understand how his or her daily activities, behaviors, and choices contribute to the accomplishment of that purpose. This is the ultimate form of cooperation in an organization. If, however, the organization's purpose is not clear, then departmental or personal objectives may become more important than organizational objectives. The result is a less cohesive organization in which workers are less likely to cooperate to accomplish the organization's goals.

By "providing a system of communication," Barnard meant that managers must create an organizational structure with a clear hierarchy (i.e., responsibilities, tasks, and jobs) and hire and promote the right people into management, that is, talented people with the right skills and education who will put the organization's needs before their own. Those managers, in turn, are responsible for promoting cooperation by effectively communicating the organization's purpose and objectives and by minimizing organizational politics.

Finally, the extent to which people willingly cooperate in an organization depends on how workers perceive executive authority and whether they're willing to accept it. According to Barnard, for many managerial requests or directives, there is a *zone of indifference*, in which acceptance of managerial authority is automatic. For example, if your boss asks you for a copy of the monthly inventory report, and compiling and writing that report is part of your job, you think nothing of the request and automatically send it. In general, people will be indifferent to managerial directives or orders if they (1) are understood, (2) are consistent with the purpose of the organization, (3) are compatible with the people's personal interests, and (4) can actually be carried

DOING THE RIGHT THING

A DANGEROUS MIX: POWER, AUTHORITY, *AND* AUTONOMY

Because of their authority to hire, fire, and reward employees, nearly all managers have the power to influence those who work for them. With jobs, promotions, or pay raises on the line, few will challenge what the boss wants, unless, as Chester Barnard suggests, they're asked to do something wrong. Even then, the boss's power and authority can be enough to get some subordinates to comply. Most dangerous of all, though, are managers who have power, authority, *and* autonomy. Adding the freedom and independence of autonomy to power and authority is like dropping a tank of gasoline on an already burning fire. An explosion is sure to result. Why? The reason is that managers with autonomy may begin to believe that the "rules" don't apply to them. When that happens, they're much more likely to engage in questionable, unethical, or illegal behavior. According to professors John Dunkelberg and Debra Ragin Jessup who studied six managers who engaged in spectacular cases of unethical and illegal behavior, "The desire to commit unethical acts is nothing without the autonomy to do so. Autonomy is the factor in the equation that sends intelligent successful people over the ethical edge. They believe they are invincible because no one is looking over their shoulder." The solution, say Dunkelberg and Jessup, is to make sure that even the most powerful people in the company haves checks, balances, and controls on their autonomy. [69]

out by those people. Acceptance of managerial authority (i.e., cooperation) is not automatic, however. Ask people to do things contrary to the organization's purpose or to their own benefit and they'll put up a fight. So, while many people assume that managers have the authority to do whatever they want, Barnard, referring to the "fiction of superior authority," believed that workers ultimately grant managers their authority. Consequently, rather than threatening workers to force cooperation, Barnard maintained that it is more effective to induce their willing cooperation through incentives, clearly formulated organizational objectives, and effective communication throughout the organization.

Review 4: Human Relations Management

Unlike most people who view conflict as bad, Mary Parker Follett, the "mother of modern management," believed that conflict could be a good thing, that it should be embraced and not avoided, and that of the three ways of dealing with conflict—domination, compromise, and integration—the latter was the best because it focuses on developing creative methods for meeting conflicting parties' needs. Follett also used four principles to emphasize the importance of coordination in organizations. She believed that the best overall outcomes are achieved when leaders and workers at different levels and in different parts of the organization directly coordinate their efforts to solve problems in an integrative way.

Elton Mayo is best known for his role in the Hawthorne Studies at the Western Electric Company. In the first stage of the Hawthorne Studies, production went up because the increased attention paid to the workers in the study and their development into a cohesive work group led to significantly higher levels of job satisfaction and productivity. In the second stage, productivity dropped because the workers had already developed strong negative norms, in which individual "rate busters" who worked faster than the rest of the team or cooperated with management were ostracized or "binged." The Hawthorne Studies demonstrated that workers' feelings and attitudes affected their work, that financial incentives weren't necessarily the most important motivator for workers, and that group norms and behavior play a critical role in behavior at work.

Chester Barnard, president of New Jersey Bell Telephone, emphasized the critical importance of willing cooperation in organizations and said that managers could gain workers' willing cooperation through three executive functions: securing essential services from individuals (through material, nonmaterial, and associational incentives), unifying the people in the organization by clearly formulated the organization's purpose and objectives, and providing a system of communication. Finally, although most managerial requests or directives will be accepted because they fall within the zone of indifference, Barnard maintains that it is more effective to induce cooperation through incentives, clearly formulated organizational objectives, and effective communication throughout the organization. Ultimately, he says, workers grant managers their authority, not the other way around.

5 OPERATIONS, INFORMATION, SYSTEMS, AND CONTINGENCY MANAGEMENT

In this last section, we review four other significant historical approaches to management that have influenced how today's managers produce goods and services on a daily basis, gather and manage the information they need to understand their businesses and make good decisions, understand how the different parts of the company work together as a whole, and recognize when and where particular management practices are likely to work.

To better understand these ideas, let's learn about **5.1 operations management; 5.2 information management; 5.3 systems management;** and **5.4 contingency management.**

5.1 Operations Management

In Chapter 18, you will learn about *operations management*, which involves managing the daily production of goods and services. In general, operations management uses a quantitative or mathematical approach to find ways to increase productivity, improve quality, and manage or reduce costly inventories. The most commonly used operations management tools and methods are quality control, forecasting techniques, capacity planning, productivity measurement and improvement, linear programming, scheduling systems, inventory systems, work measurement techniques (similar to the Gilbreths' motion studies), project management (similar to Gantt's charts), and cost-benefit analysis.[70]

Today, with those tools and techniques, we take it for granted that manufactured goods will be made with standardized, interchangeable parts; that the design of those parts will be based on specific, detailed plans; and that manufacturing companies will aggressively manage inventories to keep costs low and increase productivity. Surprisingly, these key elements of operations management have some rather strange origins: guns, geometry, and fire.

Since 1526, in Gardone, Italy, the family of Fabbrica d'Armi Pietro Beretta has been making world-renowned Beretta firearms and gun barrels. Throughout most of the company's history, skilled craftsmen made the lock, stock, and barrel of a Beretta gun by hand. After each part was made, a skilled gun finisher assembled the parts into a complete gun. The gun finisher did not simply screw the different parts of a gun together, as is done today, however. Instead, each handmade part required extensive finishing and adjusting so that it would fit together with the other handmade gun parts. This was necessary because, even when made by the same skilled craftsman, no two parts were alike. In fact, gun finishers played a role similar to that of fine watchmakers, who meticulously assembled expensive watches—without them, the product simply wouldn't work. Today, we would say that these parts were low quality because they varied so much from part to part. You'll learn more about variation and quality in Chapter 18 on managing service and manufacturing operations.

All this changed in 1791, however, when the U.S. government, worried about a possible war with France, ordered 40,000 muskets from private gun contractors. Like Beretta, all but one contractor built handmade muskets assembled by skilled gun finishers who made sure that all the parts fit together. Thus, each musket was unique. If a part broke, a replacement part had to be handcrafted. But one contractor, Eli Whitney of New Haven, Connecticut, who is better known for his invention of the cotton gin, determined that if gun parts were made accurately enough, guns could be made with standardized, interchangeable parts. So he designed machine tools that allowed unskilled workers to make each gun part the same as the next. Said Whitney, "The tools which I contemplate to make are similar to an engraving on copper plate from which may be taken a great number of impressions perceptibly alike." Years passed before Whitney delivered his 10,000 muskets to the U.S. government. In 1801, however, he demonstrated the superiority of interchangeable parts to President-elect Thomas Jefferson by quickly and easily assembling complete muskets from randomly picked piles of musket parts.

Today, because of Whitney's ideas, most products, from cars to toasters to space shuttles, are manufactured using standardized, interchangeable parts. But, even with this advance, manufacturers still faced the significant limitation that

they could not produce a part unless they had seen or examined it firsthand. Thanks to Gaspard Monge, a Frenchman of modest beginnings, this soon changed.

In Monge's time, maps were crude, often inaccurate, and almost never up-to-date. In 1762, however, as a 16-year-old, Monge drew a large-scale map of the town of Beaune, France. He developed new surveying tools and systematic methods of observation so that every feature on the map was in proportion and correctly placed. Monge's advanced skills as a draftsman led to his appointment to the prestigious École Militaire de Mézières, a military institute, where one of his first assignments was to determine the proper placement of cannons for a military fortress. This task normally involved long, complicated mathematical computations, but using the geometrical principles he had developed as a draftsman, Monge calculated his estimates so quickly that, at first, commanders refused to believe they were accurate. Soon, however, they realized the importance of his breakthrough and protected it as a military secret for more than a decade.[71]

Monge's greatest achievement, however, was his book *Descriptive Geometry*. In it, he explained techniques for drawing three-dimensional objects on paper. For the first time, precise drawings permitted manufacturers to make standardized, interchangeable parts without first examining a prototype. Today, thanks to Monge, manufacturers rely on CAD (computer-aided design) and CAM (computer-aided manufacturing) to take three-dimensional designs straight from the computer to the factory floor.

Once standardized, interchangeable parts became the norm, and parts could be made from design drawings alone, manufacturers ran into a costly problem that they had never faced before: too much inventory. *Inventory* is the amount and number of raw materials, parts, and finished products that a company has in its possession. In fact, large factories were accumulating parts inventories sufficient for two to three months, much more than they needed on a daily basis to run their manufacturing operations. Ironically, a solution to this problem was found in 1905 when the Oldsmobile Motor Works in Detroit burned down. At a time when cars were far too expensive for most Americans, Oldsmobile had become the leading automobile manufacturer in the United States by being the first to produce an affordable car. So, when the Oldsmobile factory burned down, management rented a new production facility to get production up and running as quickly as possible. But, because the new facility was much smaller, there was no room to store large stockpiles of inventory (which the company couldn't afford anyway as it was short on funds). Therefore, the company made do with what it called "hand-to-mouth inventories," in which each production station had only enough parts on hand to do a short production run. Fortunately, since all of its parts suppliers were close by, Oldsmobile could place orders in the morning and receive them in the afternoon (even without telephones), just like today's computerized, just-in-time inventory systems. So, contrary to common belief, just-in-time inventory systems were not invented by Japanese manufacturers. Instead, they were invented out of necessity a century ago because of a fire. You can learn more about just-in-time inventory management in Chapter 18.

5.2 Information Management

For most of recorded history, information has been costly, difficult to obtain, and slow to spread. Because of the immense labor and time it took to hand-copy information, books, manuscripts, and written documents of any kind were rare and extremely expensive. Word of Joan of Arc's death in 1431 took 18 months to travel from France across Europe to Constantinople (now Istanbul, Turkey). Most people literally heard news and information from the town

crier (Hear ye! Hear ye!) or from minstrel and acting groups who relayed information as they traveled from town to town.

As you will learn in Chapter 17, however, accurate, timely, relevant, and complete information has been important to businesses throughout history. The earliest recorded use of written information occurred nearly 60,000 years ago when Cro-Magnons, from whom modern humans descended, created and recorded a lunar calendar. The calendar consisted of 28 symbols carved into a reindeer antler and indicated when the waters would be high. The calendar was used to track and kill deer, bison, and elk that would gather at river crossings. Indeed, 99 percent of the clay tablets and animal-skin documents unearthed in our earliest cities are business and economic texts. Traders, craftspeople, and local businesspeople used them to keep track of trades, orders, and how much money (or gold, pigs, or chickens) was owed to whom.

Consequently, throughout history, organizations have pushed for and quickly adopted new information technologies that reduce the cost or increase the speed with which they can acquire, store, retrieve, or communicate information. The first "technologies" to truly revolutionize the business use of information were paper and the printing press. In the fourteenth century, water-powered machines were created to pulverize rags into pulp to make paper. Paper prices, which were already lower than those of animal-skin parchments, quickly dropped by 400 percent. Less than a half-century later, Johannes Gutenberg invented the printing press, which greatly reduced the cost and time needed to copy written information. For instance, in 1483 in Florence, Italy, a scribe would charge one florin (an Italian unit of money) to hand-copy one document page. By contrast, a printer would set up and print 1,025 copies of the same document for just three florins. Within 50 years of its invention, Gutenberg's printing press cut the cost of information by 1,000 percent!

What Gutenberg's printing press did for publishing, the manual typewriter did for daily communication. Before 1850, most business correspondence was written by hand and copied using the "letter press." With the ink still wet, the letter would be placed into a tissue paper "book." A hand press would then be used to squeeze the "book" and copy the still-wet ink onto the tissue paper.

Time clocks have changed dramatically since their invention in the 1890s. These pictures of factory workers punching out in 1949 with oblong cards and of a nurse "punching in" today with a biometric palm scan show how the technology has evolved in the last 50 plus years.

By the 1870s, manual typewriters made it cheaper, easier, and faster to produce and copy business correspondence. Of course, in the 1980s, slightly more than a century later, typewriters were replaced by personal computers and word processing software for identical reasons.

As the volume of printed information increased, businesses needed new ways to organize and make sense of it. Vertical file cabinets and the Woodruff file, invented in 1868, represented major advances in information storage and retrieval. Once sales orders or business correspondence were put in the proper file drawer, they could easily and quickly be found by anyone familiar with the system. The cash register, invented in 1879, kept sales clerks honest by recording all sales transactions on a roll of paper securely locked inside the machine. But managers soon realized that its most important contribution was better management and control of their business. For example, department stores could track performance and sales by installing separate cash registers in the food, clothing, and hardware departments. Time clocks, introduced in the 1890s, helped businesses keep track of worker hours and costs.

Finally, businesses have always looked for information technologies that would speed access to timely information. For instance, the Medici family, which opened banks throughout Europe in the early 1400s, used posting messengers to keep in contact with their more than 40 "branch" managers. The post messengers, who predated the U.S. Postal Service Pony Express by 400 years, could travel 90 miles per day, twice what average riders could cover, because the Medicis were willing to pay for the expense of providing them with fresh horses. This need for timely information also led companies to quickly adopt the telegraph in the 1860s, the telephone in the 1880s, and, of course, Internet technologies in the last decade. See Chapter 17 for more on how companies are using today's technologies to lower the cost and increase the speed with which accurate, timely, relevant, and complete information is acquired.

5.3 Systems Management

Today's companies are much more complex than they used to be. They are larger and employ more people. They most likely manufacture, service, *and* finance what they sell, not only in their home markets, but in foreign markets throughout the world, too. They also operate in complex, fast-changing, competitive, global environments that can quickly turn competitive advantages into competitive disadvantages.

system
A set of interrelated elements or parts that function as a whole.

subsystem
Smaller systems that operate within the context of a larger system.

synergy
When two or more subsystems working together can produce more than they can working apart.

closed systems
Systems that can sustain themselves without interacting with their environments.

open systems
Systems that can sustain themselves only by interacting with their environments, on which they depend for their survival.

How, then, can managers make sense of this complexity, both within and outside their organizations? One way to deal with organizational and environmental complexity is to take a systems view of organizations, which derived from theoretical models in biology and social psychology in the 1950s and 1960s.[72] A **system** is a set of interrelated elements or parts that function as a whole. So, rather than viewing one part of an organization as separate from the other parts, a systems approach encourages managers to complicate their thinking by looking for connections between the different parts of the organization. Indeed, one of the more important ideas in the systems approach to management is that organizational systems are composed of parts or **subsystems**, which are simply smaller systems within larger systems. Subsystems and their connections matter in systems theory because of the possibility for managers to create synergy. **Synergy** occurs when two or more subsystems working together can produce more than they can working apart. In other words, synergy occurs when 1 + 1 = 3.

Whereas **closed systems** can function without interacting with their environments, nearly all organizations should be viewed as **open systems** that interact with their environments and depend on them for survival. Therefore, rather than viewing what goes on within the organization as separate from what goes

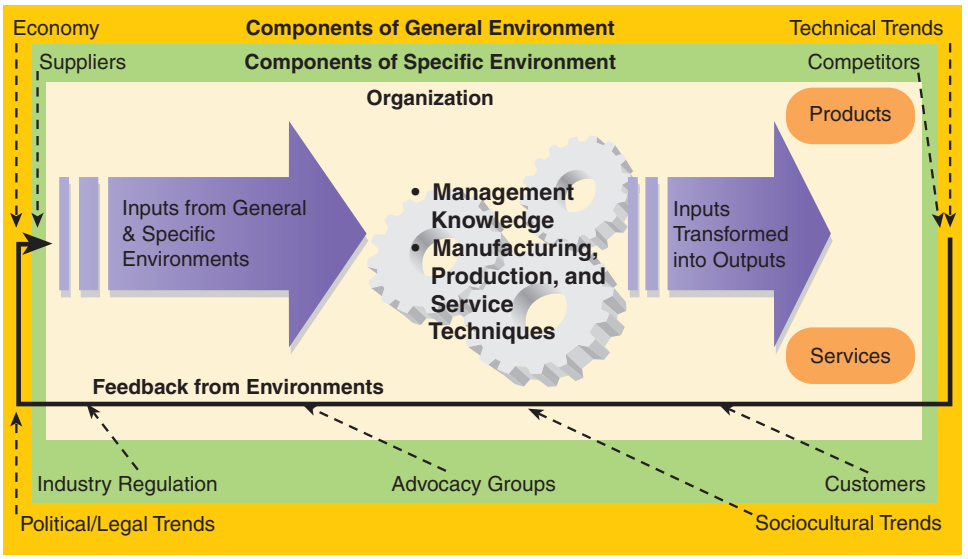

Exhibit 2.7
Systems View of Organizations

on outside it, the systems approach also encourages managers to look for connections between the different parts of the organization and the different parts of its environment. Successful interaction with organizational environments is critical because open systems tend toward **entropy**, which is the inevitable and steady deterioration of a system.

entropy
The inevitable and steady deterioration of a system.

As shown in Exhibit 2.7, organizations operate in two kinds of complex environments. The *general environment* consists of the economy and the technological, sociocultural, and political/legal trends that indirectly affect all organizations. Changes in any sector of the general environment eventually affect most organizations. In addition, each organization has a specific environment that is unique to that firm's industry and directly affects the way it conducts day-to-day business. The *specific environment* includes customers, competitors, suppliers, industry regulation, and advocacy groups. Both the general and specific environments are discussed in detail in Chapter 3. As Exhibit 2.7 shows, organizational systems obtain inputs from the general and specific environments. Managers and workers then use their management knowledge and manufacturing techniques to transform those inputs into outputs, such as products and services, which are then consumed by persons or organizations in the environment, which, in turn, provide feedback to the organization, allowing managers and workers to modify and improve their products or services.

A systems view of organizations offers several advantages. First, it forces managers to view their organizations as part of and subject to the competitive, economic, social, technological, and legal/regulatory forces in their environments.[73] Second, it also forces managers to be aware of how the environment affects specific parts of the organization. Third, because of the complexity and difficulty of trying to achieve synergies between different parts of the organization, the systems view encourages managers to focus on better communication and cooperation within the organization. Finally, it makes managers acutely aware that good internal management of the organization may not be enough to ensure survival. Survival also depends on making sure that the organization continues to satisfy critical environmental stakeholders, such as shareholders, employees, customers, suppliers, governments, and local communities. For more on ideas related to the systems view of management, see Chapter 3 on environments and cultures, Chapter 4 on ethics and social responsibility, Chapter 6 on organizational strategy, and Chapter 8 on global management.

5.4 Contingency Management

Earlier you learned that the goal of scientific management was to use systematic study to find the "one best way" of doing each task and then use that "one best way" everywhere. The problem, as you may have gathered from reading about the various approaches to management, is that no one in management seems to agree on what that "one best way" is. Furthermore, more than 100 years of management research has shown that there are clear boundaries or limitations to most management theories and practices. No management ideas or practices are universal. Though they may work much of the time, none works all the time. But, then, how is a manager to decide what theory to use? Well, it depends on the situation. The **contingency approach** to management precisely states that there are no universal management theories and that the most effective management theory or idea depends on the kinds of problems or situations that managers or organizations are facing at a particular time.[74] In short, the "best way" depends on the situation.

contingency approach
Holds that there are no universal management theories and that the most effective management theory or idea depends on the kinds of problems or situations that managers or organizations are facing at a particular time and place.

One of the practical implications of the contingency approach to management is that management is much harder than it looks. In fact, because of the clarity and obviousness of management theories (OK, most of them), students and workers often wrongly assume that if management would take just a few simple steps, then a company's problems would be quickly and easily solved. If this were true, few companies would have problems. A second implication of the contingency approach is that managers need to look for key contingencies that differentiate today's situation or problems from yesterday's situation or problems. Moreover, it means that managers need to spend more time analyzing problems, situations, and employees before taking action to fix them. Finally, it means that as you read this text and learn about management ideas and practices, you need to pay particular attention to qualifying phrases such as "usually," "in these situations," "for this to work," and "under these circumstances." Doing so will help you identify the key contingencies that will help you become a better manager.

Review 5: Operations, Information, Systems, and Contingency Management

Operations management uses a quantitative or mathematical approach to find ways to increase productivity, improve quality, and manage or reduce costly inventories. The manufacture of standardized, interchangeable parts, the graphical and computerized design of parts, and the accidental discovery of just-in-time management were some of the most important historical events in operations management.

For most of recorded history, information has been costly, difficult to obtain, and slow to spread. Consequently, throughout history, organizations have pushed for and quickly adopted new information technologies that reduce the cost or increase the speed with which they can acquire, store, retrieve, or communicate information. Historically, some of the most important technologies that have revolutionized information management were the use of horses in Italy in the 1400s, the creation of paper and the printing press in the fourteenth and fifteenth centuries, the manual typewriter in 1850, vertical file cabinets for storage of information and the telegraph in the 1860s, cash registers in 1879, the telephone in the 1880s, time clocks in the 1890s, the personal computer in the 1980s, and the Internet in the 1990s.

A system is a set of interrelated elements or parts that function as a whole. Organizational systems obtain inputs from the general and specific environments. Managers and workers then use their management knowledge and manufacturing techniques to transform those inputs into outputs, such as products and services, which are then consumed by persons or organizations in the environment, which, in turn, provide feedback to the organization, allowing

managers and workers to modify and improve their products or services. Organizational systems must also address the issues of synergy, open versus closed systems, and entropy.

Finally, the contingency approach to management precisely states that there are no universal management theories. The most effective management theory or idea depends on the kinds of problems or situations that managers or organizations are facing at a particular time. This means that management is much harder than it looks and that managers need to look for key contingencies by spending more time analyzing problems and situations before they take action to fix them.

Key Terms

bureaucracy, *45*
closed systems, *60*
compromise, *50*
contingency approach, *62*
domination, *50*
entropy, *61*
Gantt chart, *43*
integrative conflict resolution, *50*
motion study, *42*
open systems, *60*
organization, *54*
rate buster, *39*
scientific management, *39*
soldiering, *39*
subsystem, *60*
synergy, *60*
system, *60*
time study, *42*

Concept Check

1. Why do modern companies need managers?
2. How are historical management ideas and practices related to the topics you will study in this textbook?
3. Explain the contributions of Taylor, the Gilbreths, and Gantt to the theory of scientific management.
4. Compare bureaucratic and administrative management.
5. Explain the principles of Mary Parker Follett's human resource management.
6. What lessons did we learn from the Hawthorne studies? Summarize Bernard's contributions on cooperation and acceptance of authority.
7. Discuss the contributions of Whitney and Monge to operations management.
8. How do companies use systems management to make sense of organizational and environmental complexity?
9. Identify the major milestones in the history of managing information.
10. Explain contingency management.

Self-Assessment

DEALING WITH CONFLICT

Conflict is an inevitable part of work life (and life in general), and the success of individual employees, teams, and entire organizations depends on how they manage interpersonal conflict. How do you deal with conflict? Do you look for it, avoid it, or something in between? On page 614 in the Self-Assessment Appendix, you will find a 20-question assessment designed to provide insight into how you manage conflict. This information will provide you with a baseline for future development of conflict-management skills.

You can also use the Chapter 2 self-assessment as a precursor to doing the Management Team Decision below. At a minimum it will raise your awareness of how you handle differences of opinion before you begin working in a team. It may even inspire you to make conscious changes in your conflict-management style, helping you—and your team—be more effective.

Management Decision

SCRIPTED SERVICE

It has been two years since you took over your family's chain of specialty neighborhood bakeries located in areas with high foot traffic.[75] Throughout the city, your stores are *the* choice for birthday cakes, Christmas cookies, Valentine's Day cupcakes, and the daily doughnut. Even though sales are steady, you want to grow and are having a difficult time figuring out exactly how to increase revenues. For the past three weeks, you have spent each day in a different store, stocking cases, slicing bread, and generally pitching in where needed, but mostly you have been observing.

As luck would have it, about 80 percent of your stores are located near or next to a Starbucks. On your way to the stores each morning, you have stopped to get your morning coffee, and at each Starbucks, you have been greeted quickly, chatted with the clerk, ordered, heard your order repeated across the bar, used a card to pay, been asked if you want your balance, and told to have a nice day. Today is the same. As you wait for your coffee, you think about the contrast between this prescribed sequence and what you have been seeing in your own stores. Even though your clerks serve customers efficiently, they do so in various ways. Some clerks are outgoing, talking and laughing with the customer while assembling the order. Other clerks are more reserved, filling the order quickly but with little conversation and barely a smile.

Now that you have noticed these differences, everywhere you shop you've been paying attention to sales speech patterns, which appear scripted and repetitive but reliable. From the grocery ("Do you have any coupons?" and "Paper or plastic?") to the fast-food restaurant ("Do you want fries with that?" and "For here or to go?"), the patterns are most noticeable during busy periods. Clerks follow the same speech sequence with every customer.

A little research reveals that numerous companies require employees to follow a script. At McDonald's, it is a speech-only script: for example, workers must say "May I help you, ma'am?" instead of "Can I help someone?" At Olive Garden, the script adds actions to the words: greet the table within 30 seconds of sitdown; take the drink order within three minutes; during ordering, suggest five items (drink, side dish, dessert, specials, and special offers); after food arrives, check back within three minutes. At Starbucks, things are more relaxed, but there is still a script to guide employee interactions with customers looking for a latte.

After a week of observing these scripted encounters, you begin to wonder if you should write a sales script for your bakery staff. If interactions were standardized, you might be able to increase efficiency and sales revenue. A script might be a great help during the morning and the after-school rush, as well as a useful training tool for new hires; it might help them feel more confident behind the counter. Since you want to grow, a script could also help you get up and running faster in new locations. But how would your current employees feel about it? They all have different ways of working with customers. About half of them have been with you for many years and know the ropes already. And how would your customers respond? The bakery could lose some of its neighborly appeal when customers recognize the canned speech.

You hear the barrista call out, "Triple-shot Venti extra-hot latte," so you go collect your coffee. She looks you right in the eye, smiles, and says, "Have a nice day!"

Questions

1. Which historical management technique best describes scripted service speech and scripted employee behavior? Explain your choice.
2. Do you implement a customer-encounter script at your bakeries? Why or why not?
3. Imagine that you have decided to implement a script for your frontline employees. Write the service script for bakery clerks.

Management Team Decision

PEER REVIEW FOR CONFLICT RESOLUTION

Your troubles began when the teenage clerk at one of your convenience stores wrestled a gun away from a would-be robber. On hearing the story, your friends said, "How brave!" and "Did you give him an award?" but you and the other managers in the company all had a very different reaction. You know you will have to fire the employee for violating a long-standing and well-known company policy against heroism. Convenience store robberies are a common occurrence, and if your (mostly young) workers, manning dozens of stores, begin to attempt behind-the-counter vigilantism, you will have a serious problem on your hands.

Despite the unanimous mindset of your management team, you realize that firing the employee outright may create negative fallout among the other employees. At least one employee in particular is likely to vocally protest the firing. As you sit with your team trying to decide how to resolve this issue, one of your managers proposes implementing a peer review process at the company. A panel of employees would be responsible for arbitrating disputes and resolving any disagreements between how managers enforce the rules and how employees experience those rules being enforced.

Advocates trumpet the benefits of peer review systems. Peer reviews are practical and cost-effective, particularly when compared with formal legal arbitration, and they allow disputes to be resolved internally. Because peer reviews give employees some say in the outcome of disputes, the employees are more likely to find the decisions credible and acceptable. Many managers also like peer reviews because they help to avert the backlash that a manager may experience for unilaterally disciplining an employee who has violated company rules.

Detractors, however, say that peer reviews may give employees too much control over the management decision process. Review panels effectively diffuse the decision-making function throughout the organization in a way that is counter to the centralized decision making of traditionally structured companies. In addition, creating and maintaining peer review systems requires a commitment of time and resources. Employees lose work hours (i.e., productivity) when they participate on panels. And management should consult with a knowledgeable attorney to make sure that review panel procedures conform to National Labor Relations Board (NLRB) dictates about work teams. The process must be shared with all employees, who also must be trained in the process. And what will you do if employees reverse a management decision?

Nonetheless, the number of companies using peer review systems is increasing as their popularity grows. One consultant alone has over 500 companies including Kodak, Hooters, Marriott, and Red Lobster using his peer review process.

For this exercise, assemble a team of five students to act as the management team for the convenience store chain in this scenario.

Questions

1. Which historical management theory gives the best justification for implementing peer review systems? Which theory would not support peer reviews?
2. Do you implement a peer review process in the convenience store scenario? Explain your decision.
3. Regardless of your decision from question 2, as a team draw up guidelines for a peer review process. What would you need to consider if you were to create a review panel? For example, do you need to set restrictions on the ratio of employees to managers on the panel (will there even be managers on the panel?). How many years of service should an employee have to participate? Should the panel include a mix of employees from different departments?
4. Now, following the guidelines you established in question 3, imagine that your team is the review panel for the convenience store clerk who foiled a robbery. Discuss the situation and come to a decision regarding the outcome. Do you fire the employee, warn the employee, or commend his actions?

Develop Your Career Potential

KNOW WHERE MANAGEMENT IS GOING

As you read in the chapter management theories are dynamic. In other words, they change over time, sometimes very rapidly. In addition, management theories have often been cumulative, meaning that later theorists tend to build on theories previously advanced by other scholars. Thus, new theory, then becomes the starting point for yet another theory that can either refine or refute the management thinking of the day.

One way to prepare for your career as a manager is by becoming aware of management trends today. The best (and easiest) way to do that is by regularly combing through business newspapers and periodicals. You will always find at least one article that relates to management concepts, and as you scan the business press over time, you will see which theories are influencing current management thinking the most. By understanding management history and management present, you will be better able to anticipate changes to management ideas in the future. This exercise is designed to introduce you to the business press and to help you make the connection between the concepts you learn in the classroom and real-world management activities. Done regularly, it will provide you with invaluable insights into business activities at all types of organizations around the world.

Activities

1. Find a current article of substance in the business press (*The Wall Street Journal, The Financial Times, Fortune, BusinessWeek, Inc., etc*) that discusses topics covered in this course. Although this is only Chapter 2, you will be surprised by the amount of terminology you have already learned. If you are having trouble finding an article, read through the table of contents on pages vii-xii to familiarize yourself with the names of concepts that will be presented later in the term. Read your article carefully, making notes about relevant content.
2. Write a one-paragraph summary of the key points in your article. Then, list the terms or concepts critical to understanding the article, and provide definitions of those terms. If you are unfamiliar with a term or concept that is central to the article, do some research in your textbook or see your professor during office hours. Relate these key points to the concepts in your text by citing page numbers.
3. How does your article relate to the management theories covered in this chapter? Explain the situation detailed in your article in terms of the history of management.

Biz Flix
In Good Company

In Good Company is a 2004 film featuring Dennis Quaid in the role of Dan Foreman, an advertising sales executive at a top publication. After a corporate takeover, Dan is placed under a supervisor half his age named Carter Duryea (played by Topher Grace). Matters are made worse when Carter becomes romantically involved with Dan's daughter Alex, a beautiful college student (Scarlett Johansson). The film was originally titled *Synergy*. You can still hear references to that title that were kept in the final cut of the film.

What to Watch for and Ask Yourself

1. Does Carter Duryea's explanation of synergy reflect the discussion of synergy in Section 5.3?
2. What potential downside with Carter's plan does Dan identify during the meeting? Do you agree with Dan or Carter?
3. What kind of system is Carter Duryea describing in the clip? Explain.

Management Workplace
Café Pilon

Even though today's managers may be unaware of the history of management, their decisions still reflect the thinking of early theorists. Indeed, management decisions in the modern marketplace cannot help but be informed by the work conducted by management theorists decades ago. Such is the case of Rowland Roasters, a Miami-based coffee company doing business under the name of its most popular brand, Café Pilon.

What to Watch for and Ask Yourself

1. What evidence do you see of the effects of early management theories?
2. How has Rowland Roasters built on the foundation formed by the traditions of operations management?
3. What evidence of systems management do you see? What could Café Pilon do to move more toward a systems management approach?
4. Can you envision a way for Café Pilon to experience synergy?