

## Operations Management





# Operations Management

*ELLEN MATHEIN AND NICOLET COLLEGE*

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PART I

# CHAPTER 1: INTRODUCTION TO MANAGEMENT





# I. Introduction to Management

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Managers make things happen through strategic and entrepreneurial leadership.

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## *What's in It for Me?*

Reading this chapter will help you do the following:

1. Learn who managers are and about the nature of their work.
2. Know why you should care about leadership, entrepreneurship, and strategy.
3. Know the dimensions of the planning-organizing-leading-controlling (P-O-L-C) framework.
4. Learn how economic performance feeds social and environmental performance.
5. Understand what performance means at the individual and group levels.
6. Create your survivor's guide to learning and developing principles of management.

We're betting that you already have a lot of experience with organizations, teams, and leadership. You've been through

schools, in clubs, participated in social or religious groups, competed in sports or games, or taken on full- or part-time jobs. Some of your experience was probably pretty positive, but you were also likely wondering sometimes, “Isn’t there a better way to do this?”

After participating in this course, we hope that you find the answer to be “Yes!” While management is both art and science, with our help you can identify and develop the skills essential to better managing your and others’ behaviors where organizations are concerned.

Before getting ahead of ourselves, just what is management, let alone principles of management? A manager’s primary challenge is to solve problems creatively, and you should view management as “the art of getting things done through the efforts of other people.”<sup>1</sup> The principles of management, then, are the means by which you actually manage, that is, get things done through others—individually, in groups, or in organizations. Formally defined, the principles of management are the activities that “plan, organize, and control the operations of the basic elements of [people], materials, machines, methods, money and markets, providing direction and coordination, and giving leadership to human efforts, so as to achieve the sought objectives of the enterprise.”<sup>2</sup> For this reason, principles of management are often discussed or learned using a framework called P-O-L-C, which stands for planning, organizing, leading, and controlling.

Managers are required in all the activities of organizations: budgeting, designing, selling, creating, financing, accounting, and artistic presentation; the larger the organization, the more managers are needed. Everyone employed in an organization is affected by management principles, processes, policies, and practices as they are either a manager or a subordinate to a manager, and usually they are both.

Managers do not spend all their time managing. When choreographers are dancing a part, they are not managing, nor are office managers managing when they personally check out a customer’s credit. Some employees perform only part of the functions described as managerial—and to that extent, they are mostly managers in limited areas. For example, those who are assigned the preparation of plans in an advisory capacity to a manager, to that extent, are making management decisions by deciding which of several alternatives to present to the management. However, they have no participation in the functions of organizing, staffing, and supervising and no control over the implementation of the plan selected from those recommended. Even independent consultants are managers, since they get most things done through others—those *others* just happen to be their clients! Of course, if advisers or consultants have their own staff of subordinates, they become a manager in the fullest sense of the definition. They must develop business plans; hire, train, organize, and motivate their staff members; establish internal policies that will facilitate the work and direct it; and represent the group and its work to those outside of the firm.

<sup>1</sup>We draw this definition from a biography of Mary Parker Follett (1868–1933) written by P. Graham, *Mary Parker Follett: Prophet of Management* (Boston: Harvard Business School Press, 1995). Follett was an American social worker, consultant, and author of books on democracy, human relations, and management. She worked as a management and political theorist, introducing such phrases as “conflict resolution,” “authority and power,” and “the task of leadership.”

<sup>2</sup>The fundamental notion of principles of management was developed by French management theorist Henri Fayol (1841–1925). He is credited with the original planning-organizing-leading-controlling framework (P-O-L-C), which, while undergoing very important changes in content, remains the dominant management framework in the world. See H. Fayol, *General and Industrial Management* (Paris: Institute of Electrical and Electronics Engineering, 1916).

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## 2. Case in Point: Doing Good as a Core Business Strategy

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Goodwill Industries International (a nonprofit organization) has been an advocate of diversity for over 100 years. In 1902, in Boston, Massachusetts, a young missionary set up a small operation enlisting struggling immigrants in his parish to clean and repair clothing and goods to later sell. This provided workers with the opportunity for basic education and language training. His philosophy was to provide a “hand up,” not a “hand out.” Although today you can find retail stores in over 2,300 locations worldwide, and in 2009 more than 64 million people in the United States and Canada donated to Goodwill, the organization has maintained its core mission to respect the dignity of individuals by eliminating barriers to opportunity through the power of work. Goodwill accomplishes this goal, in part, by putting 84% of its revenue back into programs to provide employment, which in 2008 amounted to \$3.23 billion. As a result of these programs, every 42 seconds of every business day, someone gets a job and is one step closer to achieving economic stability.

Goodwill is a pioneer of social enterprise and has managed to build a culture of respect through its diversity programs. If you walk into a local Goodwill retail store you are likely to see employees from all walks of life, including differences in gender and race, physical ability, sexual orientation, and age. Goodwill provides

employment opportunities for individuals with disabilities, lack of education, or lack of job experience. The company has created programs for individuals with criminal backgrounds who might otherwise be unable to find employment, including basic work skill development, job placement assistance, and life skills. In 2008, more than 172,000 people obtained employment, earning \$2.3 billion in wages and gaining tools to be productive members of their community. Goodwill has established diversity as an organizational norm, and as a result, employees are comfortable addressing issues of stereotyping and discrimination. In an organization of individuals with such wide-ranging backgrounds, it is not surprising that there are a wide range of values and beliefs.

Management and operations are decentralized within the organization with 166 independent community-based Goodwill stores. These regional businesses are independent, not-for-profit human services organizations. Despite its decentralization, the company has managed to maintain its core values. Seattle's Goodwill is focused on helping the city's large immigrant population and those individuals without basic education and English language skills. And at Goodwill Industries of Kentucky, the organization recently invested in custom software to balance daily sales at stores to streamline operations so managers can spend less time on paperwork and more time managing employees.

Part of Goodwill's success over the years can be attributed to its ability to innovate. As technology evolves and such skills became necessary for most jobs, Goodwill has developed training programs to ensure that individuals are fully equipped to be productive members of the workforce, and in 2008 Goodwill was able to provide 1.5 million people with career services. As an organization, Goodwill itself has entered into the digital age. You can now find Goodwill on Facebook, Twitter, and YouTube. Goodwill's business practices encompass the values of the triple bottom line of people, planet, and profit. The organization is taking advantage of new green initiatives and pursuing opportunities for sustainability. For example, at the beginning of 2010, Goodwill received a \$7.3 million grant from the U.S. Department of Labor, which will provide funds to prepare individuals to enter the rapidly growing green industry of their choice. Oregon's Goodwill Industries has partnered with the Oregon Department of Environmental Quality and its Oregon E-Cycles program to prevent the improper disposal of electronics. Goodwill discovered long ago that diversity is an advantage rather than a hindrance.

Based on information from Goodwill Industries of North Central Wisconsin. (2009). A brief history of Goodwill Industries International. Retrieved March 3, 2010, from <http://www.goodwillncw.org/goodwillhistory1.htm>; Walker, R. (2008, November 2). Consumed: Goodwill hunting. *New York Times Magazine*, p. 18; Tabafunda, J. (2008, July 26). After 85 years, Seattle Goodwill continues to improve lives. *Northwest Asian Weekly*. Retrieved March 1, 2010, from <http://www.nwasianweekly.com/old/2008270031/goodwill20082731.htm>; Slack, E. (2009). Selling hope. *Retail Merchandiser*, 49(1), 89–91; Castillo, L. (2009, February 24). Goodwill Industries offers employment programs. *Clovis News Journal*. Retrieved April 22, 2010, from <http://www.cnjonline.com/news/industries-32474-goodwill-duttweiler.html>; Information retrieved April 22, 2010, from the Oregon E-Cycles Web site: <http://www.deq.state.or.us/lq/ecycle>.

### *Discussion Questions*

1. How might the implications of the P-O-L-C framework differ for an organization like Goodwill

Industries versus a firm like Starbucks?

2. What are Goodwill's competitive advantages?
3. Goodwill has found success in the social services. What problems might result from hiring and training the diverse populations that Goodwill is involved with?
4. Have you ever experienced problems with discrimination in a work or school setting?
5. Why do you think that Goodwill believes it necessary to continually innovate?

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# 3. Who Are Managers?

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## *Learning Objectives*

1. Know what is meant by “manager”.
2. Be able to describe the types of managers.
3. Understand the nature of managerial work.

## **Managers**

We tend to think about managers based on their position in an organization. This tells us a bit about their role and the nature of their responsibilities. The following figure summarizes the historic and contemporary views of organizations with respect to managerial roles (Ghoshal & Barlett, 1999). In contrast to the traditional, hierarchical relationship among layers of management and managers and employees, in the contemporary view, top managers support and serve other managers and employees (through a process called empowerment), just as the organization ultimately exists to serve its customers and clients. Empowerment is the process of enabling or authorizing an individual to think, behave, take action, and control work and decision making in autonomous ways.





Communication is a key managerial role.

Adrian Gaskell – Women In Management Eleanor McDonald Lecture – CC BY 2.0.

In both the traditional and contemporary views of management, however, there remains the need for different types of managers. *Top managers* are responsible for developing the organization's strategy and being a steward for its vision and mission. A second set of managers includes functional, team, and general managers. *Functional managers* are responsible for the efficiency and effectiveness of an area, such as accounting or marketing. *Supervisory* or *team managers* are responsible for coordinating a subgroup of a particular function or a team composed of members from different parts of the organization. Sometimes you will hear distinctions made between line and staff managers.

A *line manager* leads a function that contributes directly to the products or services the organization creates. For example, a line manager (often called a *product*, or *service manager*) at Procter & Gamble (P&G) is responsible for the production, marketing, and profitability of the Tide detergent product line. A *staff manager*, in contrast, leads a function that creates indirect inputs. For example, finance and accounting are critical organizational functions but do not typically provide an input into the final product or service a customer buys, such as a box of Tide detergent. Instead, they serve a supporting role. A *project manager* has the responsibility for the planning, execution, and closing of any project. Project managers are often found in construction, architecture, consulting, computer networking, telecommunications, or software development.

A *general manager* is someone who is responsible for managing a clearly identifiable revenue-producing unit, such as a store, business unit, or product line. General managers typically must make decisions across different functions and have rewards tied to the performance of the entire unit (i.e., store, business unit, product line, etc.). General managers take direction from their top executives. They must first understand the executives' overall plan for the company. Then they set specific goals for their own departments to fit in with the plan. The general manager of production, for example, might have to increase certain product lines and phase out others. General managers must describe their goals clearly to their support staff. The supervisory managers see that the goals are met.

## The Changing Roles of Management and Managers



## The Nature of Managerial Work

Managers are responsible for the processes of getting activities completed efficiently with and through other people and setting and achieving the firm's goals through the execution of four basic management functions: planning, organizing, leading, and controlling. Both sets of processes utilize human, financial, and material resources.

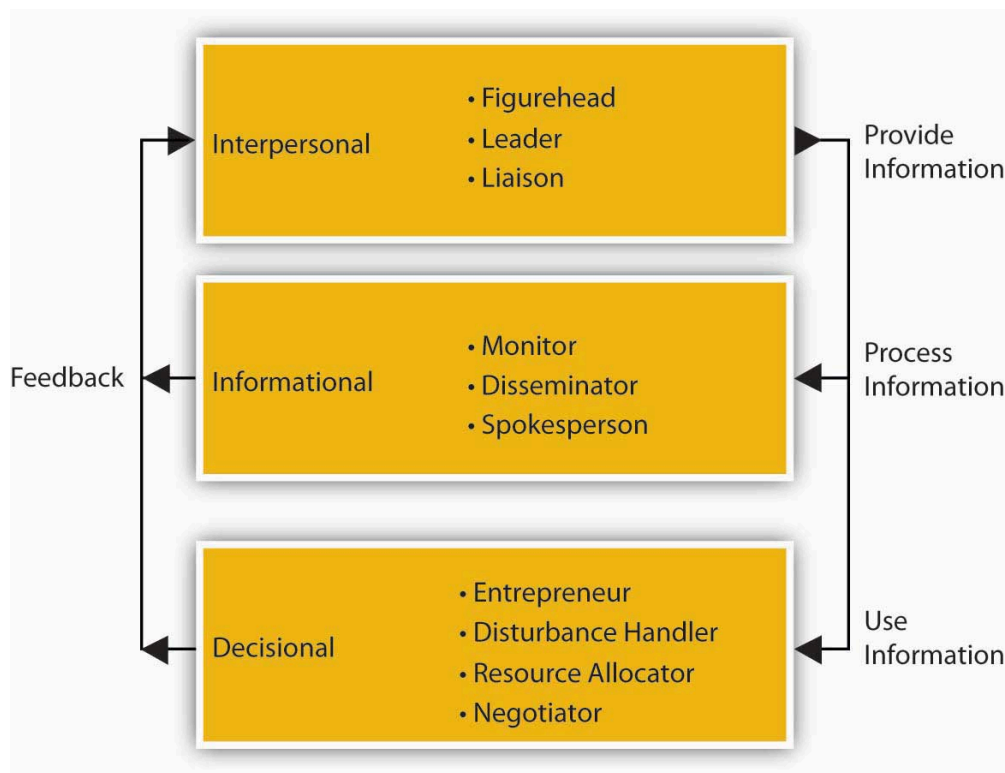
Of course, some managers are better than others at accomplishing this! There have been a number of studies on what managers actually do, the most famous of those conducted by Professor Henry Mintzberg in the early 1970s (Mintzberg, 1973). One explanation for Mintzberg's enduring influence is perhaps that the nature of managerial work has changed very little since that time, aside from the shift to an empowered relationship between top managers and other managers and employees, and obvious changes in technology, and the exponential increase in information overload.

After following managers around for several weeks, Mintzberg concluded that, to meet the many demands of performing their functions, managers assume multiple roles. A role is an organized set of behaviors, and Mintzberg identified 10 roles common to the work of all managers. As summarized in the following figure, the 10 roles are divided into three groups: interpersonal, informational, and decisional. The informational roles link all managerial work together. The interpersonal roles ensure that information is provided. The decisional roles make significant use of the information. The performance of managerial roles and the requirements of these roles can be played at different times by the same manager and to different degrees, depending on the level and function of management. The 10 roles are described individually, but they form an integrated whole.

The three interpersonal roles are primarily concerned with interpersonal relationships. In the figurehead role, the manager represents the organization in all matters of formality. The top-level manager represents the company legally and socially to those outside of the organization. The supervisor represents the work group to higher management and higher management to the work group. In the liaison role, the manager interacts with peers and people outside the organization. The top-level manager uses the liaison role to gain favors and information, while the supervisor uses it to maintain the routine flow of work. The leader role defines the relationships between the manager and employees.

### Ten Managerial Roles





The direct relationships with people in the interpersonal roles place the manager in a unique position to get information. Thus, the three informational roles are primarily concerned with the information aspects of managerial work. In the monitor role, the manager receives and collects information. In the role of disseminator, the manager transmits special information into the organization. The top-level manager receives and transmits more information from people outside the organization than the supervisor. In the role of spokesperson, the manager disseminates the organization's information into its environment. Thus, the top-level manager is seen as an industry expert, while the supervisor is seen as a unit or departmental expert.

The unique access to information places the manager at the center of organizational decision making. There are four decisional roles managers play. In the entrepreneur role, the manager initiates change. In the disturbance handler role, the manager deals with threats to the organization. In the resource allocator role, the manager chooses where the organization will expend its efforts. In the negotiator role, the manager negotiates on behalf of the organization. The top-level manager makes the decisions about the organization as a whole, while the supervisor makes decisions about his or her particular work unit.

The supervisor performs these managerial roles but with different emphasis than higher managers. Supervisory management is more focused and short-term in outlook. Thus, the figurehead role becomes less significant and the disturbance handler and negotiator roles increase in importance for the supervisor. Since leadership permeates all activities, the leader role is among the most important of all roles at all levels of management.

So what do Mintzberg's conclusions about the nature of managerial work mean for you? On the one hand, managerial work is the lifeblood of most organizations because it serves to choreograph and motivate individuals to do amazing things. Managerial work is exciting, and it is hard to imagine that there will ever be a shortage of demand for capable, energetic managers. On the other hand, managerial work is necessarily fast-paced and fragmented, where managers at all levels express the opinion that they must process much more information and make more decisions than they could have ever possibly imagined. So, just as the most successful organizations seem to have well-formed and well-executed strategies, there is also a strong need for managers to have good strategies about the way they will approach their work. This is exactly what you will learn through principles of management.

## Key Takeaway

Managers are responsible for getting work done through others. We typically describe the key managerial functions as planning, organizing, leading, and controlling. The definitions for each of these have evolved over time, just as the nature of managing in general has evolved over time. This evolution is best seen in the gradual transition from the traditional hierarchical relationship between managers and employees, to a climate characterized better as an upside-down pyramid, where top executives support middle managers and they, in turn, support the employees who innovate and fulfill the needs of customers and clients. Through all four managerial functions, the work of managers ranges across 10 roles, from figurehead to negotiator. While actual managerial work can seem challenging, the skills you gain through principles of management—consisting of the functions of planning, organizing, leading, and controlling—will help you to meet these challenges.

## Exercises

1. Why do organizations need managers?
2. What are some different types of managers and how do they differ?
3. What are Mintzberg's 10 managerial roles?
4. What three areas does Mintzberg use to organize the 10 roles?
5. What four general managerial functions do principles of management include?

## References

Ghoshal, S. and C. Bartlett, *The Individualized Corporation: A Fundamentally New Approach to Management* (New York: Collins Business, 1999).

Mintzberg, H. *The Nature of Managerial Work* (New York: Harper & Row, 1973).

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## 4. Leadership, Entrepreneurship, and Strategy

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### *Learning Objectives*

1. Know the roles and importance of leadership, entrepreneurship, and strategy in principles of management.
2. Understand how leadership, entrepreneurship, and strategy are interrelated.

The principles of management are drawn from a number of academic fields, principally, the fields of leadership, entrepreneurship, and strategy.

### Leadership

If management is defined as getting things done through others, then leadership should be defined as the social and informal sources of influence that you use to inspire action taken by others. It means mobilizing others to want to struggle toward a common goal. Great leaders help build an organization's human capital, then motivate individuals to take concerted action. Leadership also includes an understanding of when, where, and how to use more formal sources of authority and power, such as position or ownership. Increasingly, we live in a world where good *management* requires good *leaders* and *leadership*. While these views about the importance of leadership are not new (see “Views on Managers Versus Leaders”), competition among employers and countries for the best and brightest, increased labor mobility (think “war for talent” here), and hypercompetition puts pressure on firms to invest in present and future leadership capabilities.

P&G provides a very current example of this shift in emphasis to leadership as a key principle of management. For example, P&G recruits and promotes those individuals who demonstrate success through influence rather than direct or coercive authority. Internally, there has been a change from managers being outspoken and needing to direct their staff, to being individuals who electrify and inspire those around them. Good leaders and leadership at P&G used to imply having followers, whereas in today's society, good leadership means followership and bringing out the best in your peers. This is one of the key reasons that P&G has been consistently ranked among the top 10 most admired companies in the United States for the last three years, according to *Fortune* magazine (Fortune, 2008).

Whereas P&G has been around for some 170 years, another winning firm in terms of leadership is Google, which has only been around for little more than a decade. Both firms emphasize leadership in terms of being exceptional at developing people. Google has topped *Fortune*'s 100 Best Companies to Work for the past two years. Google's founders, Sergey Brin and Larry Page, built a company around the idea that work should be challenging and the challenge should be fun (Google, 2008). Google's culture is probably unlike any in corporate America, and it's not because of the ubiquitous lava lamps throughout the company's headquarters or that the company's chef used to cook for the Grateful Dead. In the same way Google puts users first when it comes to online service, Google espouses that it puts employees first when it comes to daily life in all of its offices. There is an emphasis on team achievements and pride in individual accomplishments that contribute to the company's overall success. Ideas are traded, tested, and put into practice with

a swiftness that can be dizzying. Observers and employees note that meetings that would take hours elsewhere are frequently little more than a conversation in line for lunch and few walls separate those who write the code from those who write the checks. This highly communicative environment fosters a productivity and camaraderie fueled by the realization that millions of people rely on Google results. Leadership at Google amounts to a deep belief that if you give the proper tools to a group of people who like to make a difference, they will.



Leaders inspire the collective action of others toward a shared goal.

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### *Views on Managers Versus Leaders*

*My definition of a leader...is a man who can persuade people to do what they don't want to do, or do what they're too lazy to do, and like it.*

*Harry S. Truman (1884–1972), 33rd president of the United States*

*You cannot manage men into battle. You manage things; you lead people.*

*Grace Hopper (1906–1992), Admiral, U.S. Navy*

*Managers have subordinates—leaders have followers.*

*Chester Bernard (1886–1961), former executive and author of Functions of the Executive*

*The first job of a leader is to define a vision for the organization...Leadership is the capacity to translate vision into reality.*

*Warren Bennis (1925–), author and leadership scholar*

*A manager takes people where they want to go. A great leader takes people where they don't necessarily want to go but ought to.*

*Rosalynn Carter (1927–), First Lady of the United States, 1977–1981*

## Entrepreneurship

It's fitting that this section on entrepreneurship follows the discussion of Google. Entrepreneurship is defined as the recognition of opportunities (needs, wants, problems, and challenges) and the use or creation of resources to implement innovative ideas for new, thoughtfully planned ventures. Perhaps this is obvious, but an entrepreneur is a person who engages in the process of entrepreneurship. We describe entrepreneurship as a process because it often involves more than simply coming up with a good idea—someone also has to convert that idea into action. As an example of both, Google's leaders suggest that its point of distinction "is anticipating needs not yet articulated by our global audience, then meeting them with products and services that set new standards. This constant dissatisfaction with the way things are is ultimately the driving force behind the world's best search engine (Google, 2008)."

Entrepreneurs and entrepreneurship are the catalysts for value creation. They identify and create new markets, as well as foster change in existing ones. However, such value creation first requires an opportunity. Indeed, the opportunity-driven nature of entrepreneurship is critical. Opportunities are typically characterized as problems in search of solutions, and the best opportunities are big problems in search of big solutions. "The greater the inconsistencies in existing service and quality, in lead times and in lag times, the greater the vacuums and gaps in

information and knowledge, the greater the opportunities (Timmons, 1999).” In other words, bigger problems will often mean there will be a bigger market for the product or service that the entrepreneur creates. We hope you can see why the problem-solving, opportunity-seeking nature of entrepreneurship is a fundamental building block for effective principles of management.

## Strategy

When an organization has a long-term purpose, articulated in clear goals and objectives, and these goals and objectives can be rolled up into a coherent plan of action, then we would say that the organization has a strategy. It has a *good* or even *great* strategy when this plan also takes advantage of unique resources and capabilities to exploit a big and growing external opportunity. Strategy then, is the central, integrated, externally-oriented concept of how an organization will achieve its objectives (Hambrick & Fredrickson, 2001). Strategic management is the body of knowledge that answers questions about the development and implementation of good strategies.

Strategic management is important to all organizations because, when correctly formulated and communicated, strategy provides leaders and employees with a clear set of guidelines for their daily actions. This is why strategy is so critical to the principles of management you are learning about. Simply put, strategy is about making choices: What do I do today? What shouldn't I be doing? What should my organization be doing? What should it stop doing?

## Synchronizing Leadership, Entrepreneurship, and Strategy

You know that leadership, entrepreneurship, and strategy are the inspiration for important, valuable, and useful principles of management. Now you will want to understand how they might relate to one another. In terms of principles of management, you can think of leadership, entrepreneurship, and strategic management as answering questions about “who,” “what,” and “how.” Leadership helps you understand who helps lead the organization forward and what the critical characteristics of good leadership might be. Entrepreneurial firms and entrepreneurs in general are fanatical about identifying opportunities and solving problems—for any organization, entrepreneurship answers big questions about “what” an organization’s purpose might be. Finally, strategic management aims to make sure that the right choices are made—specifically, that a good strategy is in place—to exploit those big opportunities.

One way to see how leadership, entrepreneurship, and strategy come together for an organization—and for you—is through a recent (disguised) job posting from Craigslist. Look at the ideal candidate characteristics identified in the Help Wanted ad—you don’t have to look very closely to see that if you happen to be a recent business undergrad, then the organization depicted in the ad is looking for you. The posting identifies a number of areas of functional expertise for the target candidate. You can imagine that this new position is pretty critical for the success of the business. For that reason, we hope you are not surprised to see that, beyond functional expertise, this business seeks someone with leadership, entrepreneurial, and strategic orientation and skills. Now you have a better idea of what those key principles of management involve.

### *Help Wanted—Chief of Staff*

We’re hiring a chief of staff to bring some order to the mayhem of our firm’s growth. You will touch

everything at the company, from finance to sales, marketing to operations, recruiting to human resources, accounting to investor relations. You will report directly to the CEO.

Here's what you're going to be asked to do across a range of functional areas in the first 90 days, before your job evolves into a whole new set of responsibilities:

#### Marketing

- Leverage our existing customer base using best-in-class direct marketing campaigns via e-mail, phone, Web, and print or mail communications.
- Convert our current customer spreadsheet and database into a highly functional, lean customer relationship management (CRM) system—we need to build the infrastructure to service and reach out to customers for multiple users.
- Be great at customer service personally—excelling in person and on the phone, and you will help us build a Ninja certification system for our employees and partners to be like you.
- Build our Web-enabled direct sales force, requiring a lot of strategic work, sales-force incentive design and experimentation, and rollout of Web features to support the direct channel.

#### Sales

- Be great at demonstrating our product in the showroom, as well as at your residence and in the field—plan to be one of the top sales reps on the team (and earn incremental variable compensation for your efforts).

#### Finance and Accounting

- Build our financial and accounting structures and processes, take over QuickBooks, manage our team of accountants, hire additional resources as needed, and get that profit and loss statement (P&L) rocking.
- Figure out when we should pay our bills and manage team members to get things paid on time and manage our working capital effectively.
- Track our actual revenues and expenses against your own projection—you will be building and running our financial model.

#### Operations

- We are building leading-edge capabilities on returns, exchanges, and shipping—you will help guide strategic thinking on operational solutions and will implement them with our operations manager.
- We are looking for new headquarters, you may help identify, build out, and launch.

#### HR and Recruiting

- We are recruiting a team of interns—you will take the lead on the program, and many or all of them will report to you; you will be an ombudsman of sorts for our summer program.
- The company has a host of HR needs that are currently handled by the CEO and third parties; you will take over many of these.

#### Production and Product Development

- The company is actively recruiting a production assistant/manager—in the meanwhile, there are a number of Web-facing and vendor-facing activities you will pitch in on.

#### The Ideal Candidate Is...

- a few years out of college but is at least two or three years away from going to business or other graduate school;
- charismatic and is instantly likeable to a wide variety of people, driven by sparkling wit, a high degree of extraversion, and a balanced mix of self-confidence and humility;
- able to read people quickly and knows how to treat people accordingly;
- naturally compassionate and demonstrates strong empathy, easily thinking of the world from the perspective of another person;
- an active listener and leaves people with the sense that they are well heard;
- exceptionally detail-oriented and has a memory like a steel trap—nothing falls through the cracks;
- razor sharp analytically, aced the math section of their SAT test, and excels at analyzing and solving problems;
- a perfectionist and keeps things in order with ease.

### *Key Takeaway*

The principles of management are drawn from three specific areas—leadership, entrepreneurship, and strategic management. You learned that leadership helps you understand who helps lead the organization forward and what the critical characteristics of good leadership might be. Entrepreneurs are fanatical about identifying opportunities and solving problems—for any organization, entrepreneurship answers big questions about “what” an organization’s purpose might be. Finally, as you’ve already learned, strategic management aims to make sure that the right choices are made—specifically, that a good strategy is in place—to exploit those big opportunities.

### *Exercises*

1. How do you define leadership, and who would you identify as a great leader?
2. What is entrepreneurship?
3. What is strategy?
4. What roles do leadership, entrepreneurship, and strategy play in good principles of management?



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# 5. Planning, Organizing, Leading, and Controlling

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## Learning Objectives

1. Know the dimensions of the planning-organizing-leading-controlling (P-O-L-C) framework.
2. Know the general inputs into each P-O-L-C dimension.

A manager's primary challenge is to solve problems creatively. While drawing from a variety of academic disciplines, and to help managers respond to the challenge of creative problem solving, principles of management have long been categorized into the four major functions of planning, organizing, leading, and controlling (the P-O-L-C framework). The four functions, summarized in the P-O-L-C figure, are actually highly integrated when carried out in the day-to-day realities of running an organization. Therefore, you should not get caught up in trying to analyze and understand a complete, clear rationale for categorizing skills and practices that compose the whole of the P-O-L-C framework.

It is important to note that this framework is not without criticism. Specifically, these criticisms stem from the observation that the P-O-L-C functions might be ideal but that they do not accurately depict the day-to-day actions of actual managers (Mintzberg, 1973; Lamond, 2004). The typical day in the life of a manager at any level can be fragmented and hectic, with the constant threat of having priorities dictated by the law of the trivial many and important few (i.e., the 80/20 rule). However, the general conclusion seems to be that the P-O-L-C functions of management still provide a very useful way of classifying the activities managers engage in as they attempt to achieve organizational goals (Lamond, 2004).

### The P-O-L-C Framework

Planning	Organizing	Leading	Controlling
1. Vision & Mission 2. Strategizing 3. Goals & Objectives	1. Organization Design 2. Culture 3. Social Networks	1. Leadership 2. Decision Making 3. Communications 4. Groups/Teams 5. Motivation	1. Systems/Processes 2. Strategic Human Resources

## Planning

Planning is the function of management that involves setting objectives and determining a course of action for achieving those objectives. Planning requires that managers be aware of environmental conditions facing their organization and forecast future conditions. It also requires that managers be good decision makers.

Planning is a process consisting of several steps. The process begins with environmental scanning which simply means that planners must be aware of the critical contingencies facing their organization in terms of economic conditions,

their competitors, and their customers. Planners must then attempt to forecast future conditions. These forecasts form the basis for planning.

Planners must establish objectives, which are statements of what needs to be achieved and when. Planners must then identify alternative courses of action for achieving objectives. After evaluating the various alternatives, planners must make decisions about the best courses of action for achieving objectives. They must then formulate necessary steps and ensure effective implementation of plans. Finally, planners must constantly evaluate the success of their plans and take corrective action when necessary.

There are many different types of plans and planning.

Strategic planning involves analyzing competitive opportunities and threats, as well as the strengths and weaknesses of the organization, and then determining how to position the organization to compete effectively in their environment. Strategic planning has a long time frame, often three years or more. Strategic planning generally includes the entire organization and includes formulation of objectives. Strategic planning is often based on the organization's mission, which is its fundamental reason for existence. An organization's top management most often conducts strategic planning.

Tactical planning is intermediate-range (one to three years) planning that is designed to develop relatively concrete and specific means to implement the strategic plan. Middle-level managers often engage in tactical planning.

Operational planning generally assumes the existence of organization-wide or subunit goals and objectives and specifies ways to achieve them. Operational planning is short-range (less than a year) planning that is designed to develop specific action steps that support the strategic and tactical plans.

## Organizing

Organizing is the function of management that involves developing an organizational structure and allocating human resources to ensure the accomplishment of objectives. The structure of the organization is the framework within which effort is coordinated. The structure is usually represented by an organization chart, which provides a graphic representation of the chain of command within an organization. Decisions made about the structure of an organization are generally referred to as organizational design decisions.

Organizing also involves the design of individual jobs within the organization. Decisions must be made about the duties and responsibilities of individual jobs, as well as the manner in which the duties should be carried out. Decisions made about the nature of jobs within the organization are generally called "job design" decisions.

Organizing at the level of the organization involves deciding how best to departmentalize, or cluster, jobs into departments to coordinate effort effectively. There are many different ways to departmentalize, including organizing by function, product, geography, or customer. Many larger organizations use multiple methods of departmentalization.

Organizing at the level of a particular job involves how best to design individual jobs to most effectively use human resources. Traditionally, job design was based on principles of division of labor and specialization, which assumed that the more narrow the job content, the more proficient the individual performing the job could become. However, experience has shown that it is possible for jobs to become too narrow and specialized. For example, how would you like to screw lids on jars one day after another, as you might have done many decades ago if you worked in company that made and sold jellies and jams? When this happens, negative outcomes result, including decreased job satisfaction and organizational commitment, increased absenteeism, and turnover.

Recently, many organizations have attempted to strike a balance between the need for worker specialization and the need for workers to have jobs that entail variety and autonomy. Many jobs are now designed based on such principles as empowerment, job enrichment and teamwork. For example, HUI Manufacturing, a custom sheet metal fabricator, has done away with traditional "departments" to focus on listening and responding to customer needs. From company-wide meetings to team huddles, HUI employees know and understand their customers and how HUI might service them best (Huimfg, 2008).

## Leading

Leading involves the social and informal sources of influence that you use to inspire action taken by others. If managers are effective leaders, their subordinates will be enthusiastic about exerting effort to attain organizational objectives.

The behavioral sciences have made many contributions to understanding this function of management. Personality research and studies of job attitudes provide important information as to how managers can most effectively lead subordinates. For example, this research tells us that to become effective at leading, managers must first understand their subordinates' personalities, values, attitudes, and emotions.

Studies of motivation and motivation theory provide important information about the ways in which workers can be energized to put forth productive effort. Studies of communication provide direction as to how managers can effectively and persuasively communicate. Studies of leadership and leadership style provide information regarding questions, such as, "What makes a manager a good leader?" and "In what situations are certain leadership styles most appropriate and effective?"



Quality control ensures that the organization delivers on its promises.

International Maize and Wheat Improvement Center – Maize seed quality control at small seed company

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## Controlling

Controlling involves ensuring that performance does not deviate from standards. Controlling consists of three steps, which include (1) establishing performance standards, (2) comparing actual performance against standards, and (3) taking corrective action when necessary. Performance standards are often stated in monetary terms such as revenue, costs, or profits but may also be stated in other terms, such as units produced, number of defective products, or levels of quality or customer service.

The measurement of performance can be done in several ways, depending on the performance standards, including financial statements, sales reports, production results, customer satisfaction, and formal performance appraisals. Managers at all levels engage in the managerial function of controlling to some degree.

The managerial function of controlling should not be confused with control in the behavioral or manipulative sense. This function does not imply that managers should attempt to control or to manipulate the personalities, values, attitudes, or emotions of their subordinates. Instead, this function of management concerns the manager's role in taking necessary actions to ensure that the work-related activities of subordinates are consistent with and contributing toward the accomplishment of organizational and departmental objectives.

Effective controlling requires the existence of plans, since planning provides the necessary performance standards

or objectives. Controlling also requires a clear understanding of where responsibility for deviations from standards lies. Two traditional control techniques are budget and performance audits. An audit involves an examination and verification of records and supporting documents. A budget audit provides information about where the organization is with respect to what was planned or budgeted for, whereas a performance audit might try to determine whether the figures reported are a reflection of actual performance. Although controlling is often thought of in terms of financial criteria, managers must also control production and operations processes, procedures for delivery of services, compliance with company policies, and many other activities within the organization.

The management functions of planning, organizing, leading, and controlling are widely considered to be the best means of describing the manager's job, as well as the best way to classify accumulated knowledge about the study of management. Although there have been tremendous changes in the environment faced by managers and the tools used by managers to perform their roles, managers still perform these essential functions.

### *Key Takeaway*

The principles of management can be distilled down to four critical functions. These functions are planning, organizing, leading, and controlling. This P-O-L-C framework provides useful guidance into what the ideal job of a manager should look like.

### *Exercises*

1. What are the management functions that comprise the P-O-L-C framework?
2. Are there any criticisms of this framework?
3. What function does planning serve?
4. What function does organizing serve?
5. What function does leading serve?
6. What function does controlling serve?

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# 6. Economic, Social, and Environmental Performance

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## *Learning Objectives*

1. Be able to define economic, social, and environmental performance.
2. Understand how economic performance is related to social and environmental performance.

Webster's dictionary defines performance as "the execution of an action" and "something accomplished" (Merriam Webster, 2008). Principles of management help you better understand the inputs into critical organizational outcomes like a firm's economic performance. Economic performance is very important to a firm's stakeholders particularly its investors or owners, because this performance eventually provides them with a return on their investment. Other stakeholders, like the firm's employees and the society at large, are also deemed to benefit from such performance, albeit less directly. Increasingly though, it seems clear that noneconomic accomplishments, such as reducing waste and pollution, for example, are key indicators of performance as well. Indeed, this is why the notion of the triple bottom line is gaining so much attention in the business press. Essentially, the triple bottom line refers to The measurement of business performance along social, environmental, *and* economic dimensions. We introduce you to economic, social, and environmental performance and conclude the section with a brief discussion of the interdependence of economic performance with other forms of performance.

## **Economic Performance**

In a traditional sense, the economic performance of a firm is a function of its success in producing benefits for its owners in particular, through product innovation and the efficient use of resources. When you talk about this type of economic performance in a business context, people typically understand you to be speaking about some form of profit.

The definition of economic profit is the difference between revenue and the opportunity cost of all resources used to produce the items sold (Albrecht, 1983). This definition includes implicit returns as costs. For our purposes, it may be simplest to think of economic profit as a form of accounting profit where profits are achieved when revenues exceed the accounting cost the firm "pays" for those inputs. In other words, your organization makes a profit when its revenues are more than its costs in a given period of time, such as three months, six months, or a year.

Before moving on to social and environmental performance, it is important to note that *customers* play a big role in economic profits. Profits accrue to firms because customers are willing to pay a certain price for a product or service, as opposed to a competitor's product or service of a higher or lower price. If customers are only willing to make purchases based on price, then a firm, at least in the face of competition, will only be able to generate profit if it keeps its costs under control.

# Social and Environmental Performance

You have learned a bit about economic performance and its determinants. For most organizations, you saw that economic performance is associated with profits, and profits depend a great deal on how much customers are willing to pay for a good or service.

With regard to social and environmental performance, it is similarly useful to think of them as forms of profit—social and environmental profit to be exact. Increasingly, the topics of social and environmental performance have garnered their own courses in school curricula; in the business world, they are collectively referred to as corporate social responsibility (CSR)

CSR is a concept whereby organizations consider the interests of society by taking responsibility for the impact of their activities on customers, suppliers, employees, shareholders, communities, and the environment in all aspects of their operations. This obligation is seen to extend beyond the statutory obligation to comply with legislation and sees organizations voluntarily taking further steps to improve the quality of life for employees and their families, as well as for the local community and society at large.

Two companies that have long blazed a trail in CSR are Ben & Jerry's and S. C. Johnson. Their statements about why they do this, summarized in Table 1.1 “Examples of leading firms with strong CSR orientations”, capture many of the facets just described.

Table 1.1 Examples of leading firms with strong CSR orientations

Why We Do It?	
Ben & Jerry's	“We’ve taken time each year since 1989 to compile this [Social Audit] report because we continue to believe that it keeps us in touch with our Company’s stated Social Mission. By raising the profile of social and environmental matters inside the Company and recording the impact of our work on the community, this report aids us in our search for business decisions that support all three parts of our Company Mission Statement: Economic, Product, and Social. In addition, the report is an important source of information about the Company for students, journalists, prospective employees, and other interested observers. In this way, it helps us in our quest to keep our values, our actions, and public perceptions in alignment (Benjerrys, 2008).”
S. C. Johnson	“It’s nice to live next door to a family that cares about its neighbors, and at S. C. Johnson we are committed to being a good neighbor and contributing to the well-being of the countries and the communities where we conduct business. We have a wide variety of efforts to drive global development and growth that benefit the people around us and the planet we all share. From exceptional philanthropy and volunteerism to new business models that bring economic growth to the world’s poorest communities, we’re helping to create stronger communities for families around the globe” (Scjohnson, 2008).





Environmentally Neutral Design (END) designs shoes with the goal of eliminating the surplus material needed to make a shoe such that it costs less to make and is lighter than other performance shoes on the market.

ideowl – Carbon Neutral Shoes – CC BY 2.0.

## Integrating Economic, Social, and Environmental Performance

Is there really a way to achieve a triple bottom line in a way that actually builds up all three facets of performance—economic, social, and environmental? Advocates of CSR understandably argue that this is possible and should be the way all firms are evaluated. Increasingly, evidence is mounting that attention to a triple bottom line is more than being “responsible” but instead just good business. Critics argue that CSR detracts from the fundamental economic role of businesses; others argue that it is nothing more than superficial window dressing; still, others argue that it is an attempt to preempt the role of governments as a watchdog over powerful multinational corporations.

While there is no systematic evidence supporting such a claim, a recent review of nearly 170 research studies on the relationship between CSR and firm performance reported that there appeared to be no negative shareholder effects of such practices. In fact, this report showed that there was a small positive relationship between CSR and shareholder returns (Margolis & Elfenbein, 2008). Similarly, companies that pay good wages and offer good benefits to attract and retain high-caliber employees “are not just being socially responsible; they are merely practicing good management” (Reich, 2007).

The financial benefits of social or environmental CSR initiatives vary by context. For example, environment-friendly

strategies are much more complicated in the consumer products and services market. For example, cosmetics retailer The Body Shop and StarKist Seafood Company, a strategic business unit of Heinz Food, both undertook environmental strategies but only the former succeeded. The Body Shop goes to great lengths to ensure that its business is ecologically sustainable (Bodyshop, 2008). It actively campaigns against human rights abuses and for animal and environmental protection and is one of the most respected firms in the world, despite its small size. Consumers pay premium prices for Body Shop products, ostensibly because they believe that it simply costs more to provide goods and services that are environmentally friendly. The Body Shop has been wildly successful.

StarKist, too, adopted a CSR approach, when, in 1990, it decided to purchase and sell exclusively dolphin-safe tuna. At the time, biologists thought that the dolphin population decline was a result of the thousands killed in the course of tuna harvests. However, consumers were unwilling to pay higher prices for StarKist's environmental product attributes. Moreover, since tuna were bought from commercial fishermen, this particular practice afforded the firm no protection from imitation by competitors. Finally, in terms of credibility, the members of the tuna industry had launched numerous unsuccessful campaigns in the past touting their interest in the environment, particularly the world's oceans. Thus, consumers did not perceive StarKist's efforts as sincerely "green."

You might argue that The Body Shop's customers are unusually price insensitive, hence the success of its environment-based strategy. However, individuals are willing to pay more for organic produce, so why not dolphin-safe tuna? One difference is that while the environment is a public good, organic produce produces both public and private benefits. For example, organic farming is better for the environment and pesticide-free produce is believed to be better for the health of the consumer. Dolphin-free tuna only has the public environmental benefits (i.e., preserve the dolphin population and oceans' ecosystems), not the private ones like personal health. It is true that personal satisfaction and benevolence are private benefits, too. However, consumers did not believe they were getting their money's worth in this regard for StarKist tuna, whereas they do with The Body Shop's products.

Somewhere in our dialogue on CSR lies the idea of making the solution of an environmental or social problem the primary purpose of the organization. Cascade Asset Management (CAM), is a case in point (Cascade, 2008). CAM was created in April 1999, in Madison, Wisconsin, and traces its beginnings to the University of Wisconsin's Entrepreneurship program where the owners collaborated on developing and financing the initial business plan. CAM is a private, for-profit enterprise established to provide for the environmentally responsible disposition of computers and other electronics generated by businesses and institutions in Wisconsin. With their experience and relationships in surplus asset disposition and computer hardware maintenance, the founders were able to apply their skills and education to this new and developing industry.

Firms are willing to pay for CAM's services because the disposal of surplus personal computers (PCs) is recognized as risky and highly regulated, given the many toxic materials embedded in most components. CAM's story is also credible (whereas StarKist had trouble selling its CSR story). The company was one of the original signers of the "Electronic Recyclers Pledge of True Stewardship" (Computertakeback, 2008) Signers of the pledge are committed to the highest standards of environmental and economic sustainability in their industry and are expected to live out this commitment through their operations and partnerships. The basic principles of the pledge are as follows: no export of untested whole products or hazardous components or commodities (CRTs, circuit boards) to developing countries, no use of prison labor, adherence to an environmental and worker safety management system, provision of regular testing and audits to ensure compliance, and support efforts to encourage producers to make their products less toxic. CAM has grown rapidly and now serves over 500 business and institutional customers from across the country. While it is recognized as one of the national leaders in responsible, one-stop information technology (IT) asset disposal, its success is attracting new entrants such as IBM, which view PC recycling as another profitable service they can offer their existing client base (IBM, 2008).

## Key Takeaway

Organizational performance can be viewed along three dimensions—financial, social, and environmental—collectively referred to as the triple bottom line, where the latter two dimensions are included in the definition of CSR. While there remains debate about whether organizations should consider environmental and social impacts when making business decisions, there is increasing pressure to include such CSR activities in what constitutes good principles of management. This pressure is based on arguments that range from CSR helps attract and retain the best and brightest employees, to showing that the firm is being responsive to market demands, to observations about how some environmental and social needs represent great entrepreneurial business opportunities in and of themselves.

## Exercises

1. Why is financial performance important for organizations?
2. What are some examples of financial performance metrics?
3. What dimensions of performance beyond financial are included in the triple bottom line?
4. How does CSR relate to the triple bottom line?
5. How are financial performance and CSR related?

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# 7. Performance of Individuals and Groups

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## Learning Objectives

1. Understand the key dimensions of individual-level performance.
2. Understand the key dimensions of group-level performance.
3. Know why individual- and group-level performance goals need to be compatible.

Principles of management are concerned with organization-level outcomes such as economic, social, or environmental performance, innovation, or ability to change and adapt. However, for something to happen at the level of an organization, something must typically also be happening within the organization at the individual or team level. Obviously, if you are an entrepreneur and the only person employed by your company, the organization will accomplish what you do and reap the benefits of what you create. Normally though, organizations have more than one person, which is why we introduce to you concepts of individual and group performance.

## Individual-Level Performance

Individual-level performance draws upon those things you have to do in your job, or in-role performance, and those things that add value but which aren't part of your formal job description. These "extras" are called extra-role performance or organizational citizenship behaviors (OCBs). At this point, it is probably simplest to consider an in-role performance as having productivity and quality dimensions associated with certain standards that you must meet to do your job. In contrast, OCBs can be understood as individual behaviors that are beneficial to the organization and are discretionary, not directly or explicitly recognized by the formal reward system (Organ, 1988).

In comparison to in-role performance, the spectrum of what constitutes extra-role performance, or OCBs, seems be great and growing. In a recent review, for example, management researchers identified 30 potentially different forms of OCB, which they conveniently collapsed into seven common themes: (1) Helping Behavior, (2) Sportsmanship, (3) Organizational Loyalty, (4) Organizational Compliance, (5) Individual Initiative, (6) Civic Virtue, and (7) Self-Development (Podsakoff, et. al., 2000). Definitions and examples for these seven themes are summarized in Table 1.2 "A current survey of organization citizenship behaviors" (Organ, 1990; Graham, 1991; George & Jones, 1997; George & Jones, 1997; Graham, 1991; Organ, 1994; Moorman & Blakely, 1995).

Table 1.2 A current survey of organization citizenship behaviors

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	<p><b>Altruism</b></p> <ul style="list-style-type: none"> <li>• Voluntary actions that help another person with a work problem.</li> <li>• Instructing a new hire on how to use equipment, helping a coworker catch up with a backlog of work, fetching materials that a colleague needs and cannot procure on their own.</li> </ul> <p><b>Interpersonal helping</b></p> <ul style="list-style-type: none"> <li>• Focuses on helping coworkers in their jobs when such help was needed.</li> </ul> <p><b>Courtesy</b></p> <ul style="list-style-type: none"> <li>• Subsumes all of those foresightful gestures that help someone else prevent a problem.</li> <li>• Touching base with people before committing to actions that will affect them, providing advance notice to someone who needs to know to schedule work.</li> </ul> <p><b>Peacemaking</b></p> <ul style="list-style-type: none"> <li>• Actions that help to prevent, resolve, or mitigate unconstructive interpersonal conflict.</li> </ul> <p><b>Cheerleading</b></p> <ul style="list-style-type: none"> <li>• The words and gestures of encouragement and reinforcement of coworkers.</li> <li>• Accomplishments and professional development.</li> </ul>
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<b>Sportsmanship</b>	A citizenlike posture of tolerating the inevitable inconveniences and impositions of work without whining and grievances.
<b>Organizational Loyalty</b>	Identification with and allegiance to organizational leaders and the organization as a whole, transcending the parochial interests of individuals, work groups, and departments. Representative behaviors include defending the organization against threats, contributing to its good reputation, and cooperating with others to serve the interests of the whole.
<b>Organizational Compliance</b> (or Obedience)	An orientation toward organizational structure, job descriptions, and personnel policies that recognizes and accepts the necessity and desirability of a rational structure of rules and regulations. Obedience may be demonstrated by a respect for rules and instructions, punctuality in attendance and task completion, and stewardship of organizational resources.
<b>Individual Initiative</b> (or Conscientiousness)	A pattern of going well beyond minimally required levels of attendance, punctuality, housekeeping, conserving resources, and related matters of internal maintenance.
<b>Civic Virtue</b>	Responsible, constructive involvement in the political process of the organization, including not just expressing opinions but reading one's mail, attending meetings, and keeping abreast of larger issues involving the organization.
<b>Self-Development</b>	Includes all the steps that workers take to voluntarily improve their knowledge, skills, and abilities so as to be better able to contribute to their organizations. Seeking out and taking advantage of advanced training courses, keeping abreast of the latest developments in one's field and area, or even learning a new set of skills so as to expand the range of one's contributions to an organization.

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As you can imagine, principles of management are likely to be very concerned with individuals' in-role performance. At the same time, just a quick glance through Table 1.2 "A current survey of organization citizenship behaviors" should suggest that those principles should help you better manage OCBs as well.



## Group-Level Performance

A group is a collection of individuals. Group-level performance focuses on both the outcomes and process of collections of individuals, or groups. Individuals can work on their own agendas in the context of a group. Groups might consist of project-related groups, such as a product group or an entire store or branch of a company. The performance of a group consists of the inputs of the group minus any process loss that result in the final output, such as the quality of a product and the ramp-up time to production or the sales for a given month. Process loss is any aspect of group interaction that inhibits good problem solving.

A Contemporary Management Team



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Why do we say *group* instead of *team*? A collection of people is not a team, though they may learn to function in that way. A team is a cohesive coalition of people working together to achieve the team agenda (i.e., teamwork). Being on a team is not equal to total subordination of personal agendas, but it does require a commitment to the vision and involves each individual directly in accomplishing the team's objective. Teams differ from other types of groups in that members are focused on a joint goal or product, such as a presentation, completing in-class exercises, discussing a topic, writing a report, or creating a new design or prototype. Moreover, teams also tend to be defined by their relatively smaller size. For example, according to one definition, "A team is a *small* number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they are mutually accountable" (Katzenback & Smith, 1993)

The purpose of assembling a team is to accomplish bigger goals that would not be possible for the individual working alone or the simple sum of many individuals' independent work. Teamwork is also needed in cases where multiple skills are needed or where buy-in is required from certain key stakeholders. Teams can, but do not always, provide improved performance. Working together to further the team agenda seems to increase mutual cooperation between what are often competing factions. The aim and purpose of a team is to perform, to get results, and to achieve victory in the workplace and marketplace. The very best managers are those who can gather together a group of individuals and mold them into an effective team.

## Compatibility of Individual and Group Performance

As a manager, you will need to understand the compatibility of individual and group performance, typically with respect to goals and incentives. What does this mean? Looking at goals first, there should be compatibility between individual and group goals. For example, do the individuals' goals contribute to the achievement of the group goal or are they contradictory? Incentives also need to be aligned between individuals and groups. A disconnect between these is most likely when individuals are too far insulated from the external environment or rewarded for action that is not consistent with the goal. For example, individuals may be seeking to perfect a certain technology and, in doing so, delay its release to customers, when customers would have been satisfied with the current solution and put a great priority on its timely delivery. Finally, firms need to be careful to match their goals with their reward structures. For example, if the organization's goal is to increase group performance but the firm's performance appraisal process rewards individual employee productivity, then the firm is unlikely to create a strong team culture.

### *Key Takeaway*

This section helped you understand individual and group performance and suggested how they might roll up into organizational performance. Principles of management incorporate two key facets of individual performance: in-role and OCB (or extra-role) performance. Group performance, in turn, was shown to be a function of how well individuals achieved a combination of individual and group goals. A team is a type of group that is relatively small, and members are willing and able to subordinate individual goals and objectives to those of the larger group.

### *Exercises*

1. What is in-role performance?
2. What is extra-role performance?
3. What is the relationship between extra-role performance and OCBs?
4. What differentiates a team from a group?
5. When might it be important to understand the implications of individual performance for group performance?

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PART II

CHAPTER 2: THE HISTORY OF MANAGEMENT



# 8. Introduction

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## Learning Objectives

**After reading this chapter, you should be able to answer these questions:**

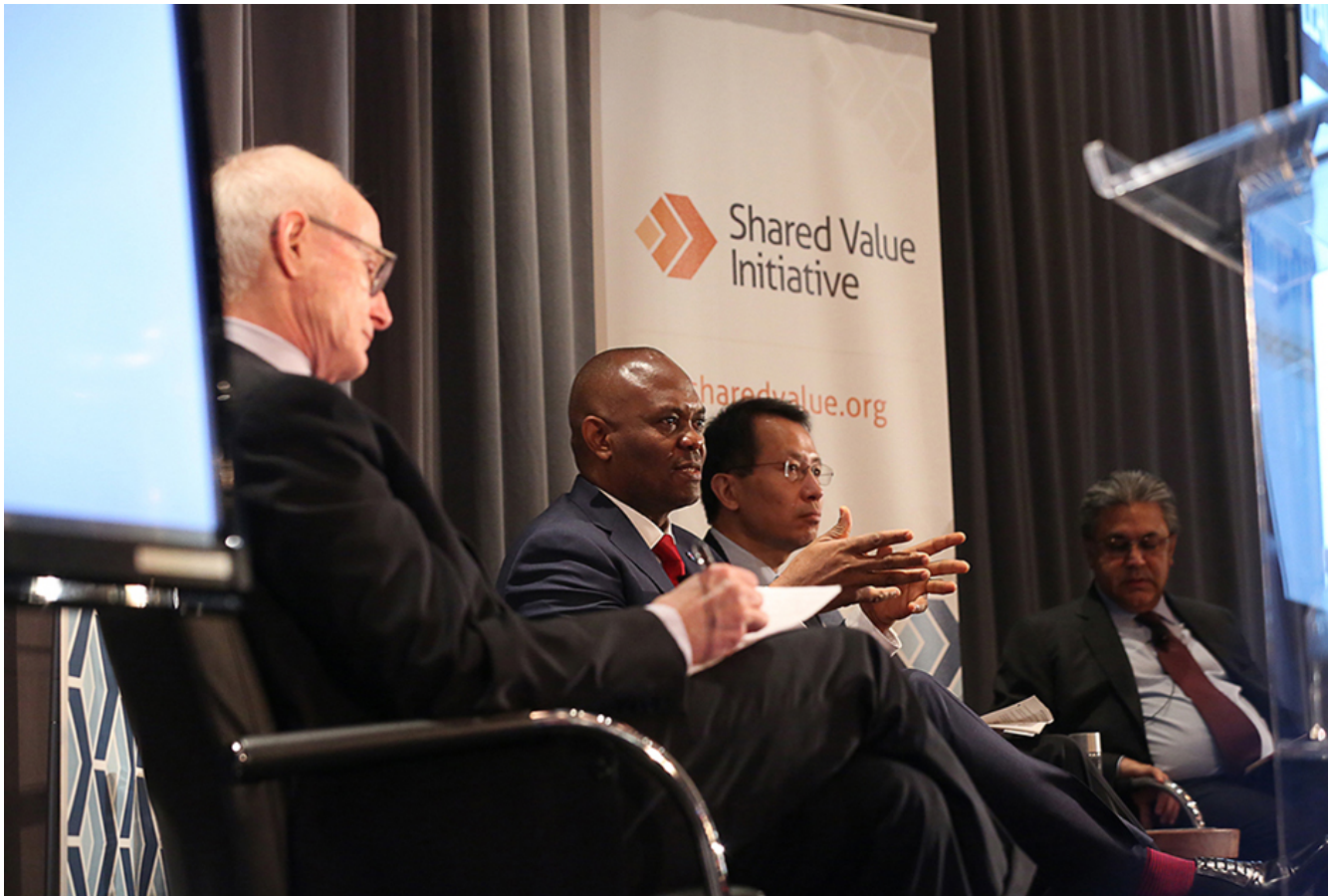
1. Describe management in the ancient world.
2. How did the Italian Renaissance affect the progression of management theory?
3. How did the Industrial Revolution affect the progression of management theory?
4. How did Frederick Winslow Taylor influence management theory, and how did efficiency in management affect current management theory?
5. How do bureaucratic and administrative management complement scientific management?
6. How did Elton Mayo influence management theory, and how did the human relations movement affect current management theory?
7. How did contingency and systems management transform management thought?

## EXPLORING MANAGERIAL CAREERS

*Michael Porter: Harvard Professor and Management Consultant, The Monitor Group*

Michael Porter is the Bishop William Lawrence University Professor at Harvard Business School and one of the foremost scholars and consultants in business strategy. Dubbed the first “Lord of Strategy,” he is one of the most influential management thinkers of all time. Porter’s primary contribution is in the field of competition, specifically the question of why some companies profit while others do not. Porter first became interested in competition due to his enthusiasm competing in youth sports (baseball, football, and basketball).

Porter was born in 1947 and graduated from Princeton in 1969 with a degree in aerospace and mechanical engineering. He went on to receive his MBA from Harvard Business School in 1971 and his PhD in business economics from Harvard University in 1973. His book *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (published in 1980) was deemed the ninth most influential work of the 20th century by the Fellows of the Academy of Management. Porter, writing during a period of great economic competition between the United States and Japan, was able to gain a wide and vast audience for his work.



Michael E. Porter leads a conversation with three leading public and private investors, Jin-Yong Cai, Tony O. Elumelu, and Arif Naqvi, on the panel “Investing in Prosperity: A Conversation with Global Leaders” at the Shared Value Leadership Summit. (Shared Value Initiative/ flickr/ Attribution 2.0 Generic (CC BY 2.0))

In his 1979 *Harvard Business Review* article “How Competitive Forces Shape Strategy,” Porter presented his game management idea that five forces help determine the level of profitability. The five forces are competition in the industry, potential of new entrants into the industry, power of suppliers, power of customers, and threat of substitute products. An unattractive industry is one in which the five forces align themselves to produce a purely competitive industry. In this type of industry, normal profit levels are the highest a firm can expect, which means that the firm can cover its costs and make the owner a profit but cannot make excess profits. Once a firm identifies the five forces in its industry, it can choose between one of three generic strategies for success focus, differentiation, or cost leadership. Depending on where a firm is positioned within the market, the marketplace will determine what strategy it can take. This “five forces, three strategies” framework explains how McDonald’s, Morton’s Steakhouse, Subway, Wendy’s, and TGIF can all be in the same industry and still be profitable. They offer different types of products to different types of customers. These products compete on price, differentiation, focus, or a combination of these. In addition to the five forces model, Porter developed the value-chain model, which describes the unique activities that a corporation performs to make its products valuable to its customers. Porter has also contributed to health-care management, environmental regulation, international competition, and industry-level profits.

Porter’s five forces framework is intuitive and has provided managers with an approach to develop actual strategies. His ideas became popular because business leaders wanted to know how their companies could compete. Prior to Porter, management scholars stressed the idiosyncratic nature of business, stressing how each situation faced by each business was different. Other scholars offered business strategy models, but they were not as useful or practical as

Porter's. Through his use of industrial-organizational economics and his training in the case method, Porter bridged the gap between theoretical frameworks and the reality of the competitive business world and became one of the most important thinkers on business in the world.

Sources: Bedeian, Arthur G and Wren, Daniel A. (Winter 2001). "Most Influential Management Books of the 20th Century" (PDF). *Organizational Dynamics*. 29 (3): 221–225; Kiechel, Walter (2010). *The Lords of Strategy: The Secret Intellectual History of the New Corporate World*. *Harvard Business Review Press*; Magretta, Joan (2011). *Understanding Michael Porter: The Essential Guide to Competition and Strategy*. *Harvard Business Review Press*; and Mathews, J.(2013-02-01). *The Competitive Advantage of Michael Porter*. In *The Oxford Handbook of Management Theorists*: *Oxford University Press*.

While you may think that management is a relatively new field, it actually has its roots in the ancient world. In fact, whenever and wherever there has been commerce, there has been management and those thinking about how to do it better. For example, the Seven Wonders of the Ancient World, including the Colossus of Rhodes, the Hanging Gardens of Babylon, and the Great Pyramid, could only have been constructed through the work of a great many people. The size and complexity of these structures suggest that there must have been people (managers) who coordinated the labor and resources needed to execute the construction plans. Similarly, the Romans and the ancient Chinese could not have managed their vast empires without management, nor could the Phoenicians and the Greeks have dominated oceangoing trade without management.

Because management has been around for a while, it makes sense that the study of management is old. This idea is supported by the many managerial insights we can find in political, diplomatic, and military history and in philosophy, poetry, economics, and literature. Anyone familiar with Shakespeare's *King Lear* would recognize the present-day management problem of succession planning! Modern managers have been influenced by the works of Chinese military strategist and philosopher Sun Tzu, Roman general and politician Julius Caesar, and even Genghis Kahn, Mongolian conqueror and ruler of what became the largest land empire in all of history.<sup>1</sup> Mark Zuckerberg<sup>2</sup> of Facebook is a modern admirer of the Caesars and has said that he bases some of his management style on his classical education.

Despite its ancient roots, modern management is less than 150 years old. In fact, a comparison of management before and after the Industrial Revolution shows that the former is only a shadowy comparison to the latter. Prior to the Industrial Revolution, work was performed, with exceptions, mostly in home and on farms by forced labor (slaves or indentured servants) or family members, and the output they produced was often for employers', local, or family consumption. Over the centuries, economics and morality shifted, and laborers could choose where and for whom to work. These changes, in turn, would bring about many changes in how labor and other resources were employed in production.

The two developments that transformed management were the revolutions in how and where goods were sold and the Industrial Revolution. The events combined led to the selling of a wider variety of goods to a wider variety of customers in more distant locations. These events also led to the establishment of vast companies. Competition required the development of economies of scale (i.e., increased production lowering costs) and required coordination and specialization in the use of resources. The combination of coordination and specialization problems encouraged the development of management study as a distinct field.

In this chapter, we trace the evolution of management from its origins in the ancient world to its form as a modern profession. Understanding how management came to be helps us to understand its principles in a richer, more thorough context and to understand how each concept we discuss is based on evidence produced by a wide range of scholars over many years in the fields of engineering, economics, psychology, sociology, and anthropology.

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# 9. The Early Origins of Management

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1. Describe management in the ancient world.

**Table 3.1** traces the development of management thought from the ancient world until the 19th century’s Industrial Revolution.

Sumer, located in what is today southern Iraq and the first urban-based civilization, contained the genesis of management. Sumer had a flourishing merchant culture in which goods such as grains, livestock, perfumes, and pottery were sold to customers. Rather than bartering (using one good or service, not money, to pay for another good or service), the ancient Sumerians used ancient clay coins to pay. The sizes and shapes of coins represented different amounts of currency and signaled the types of goods for which they could be exchanged.<sup>3</sup>

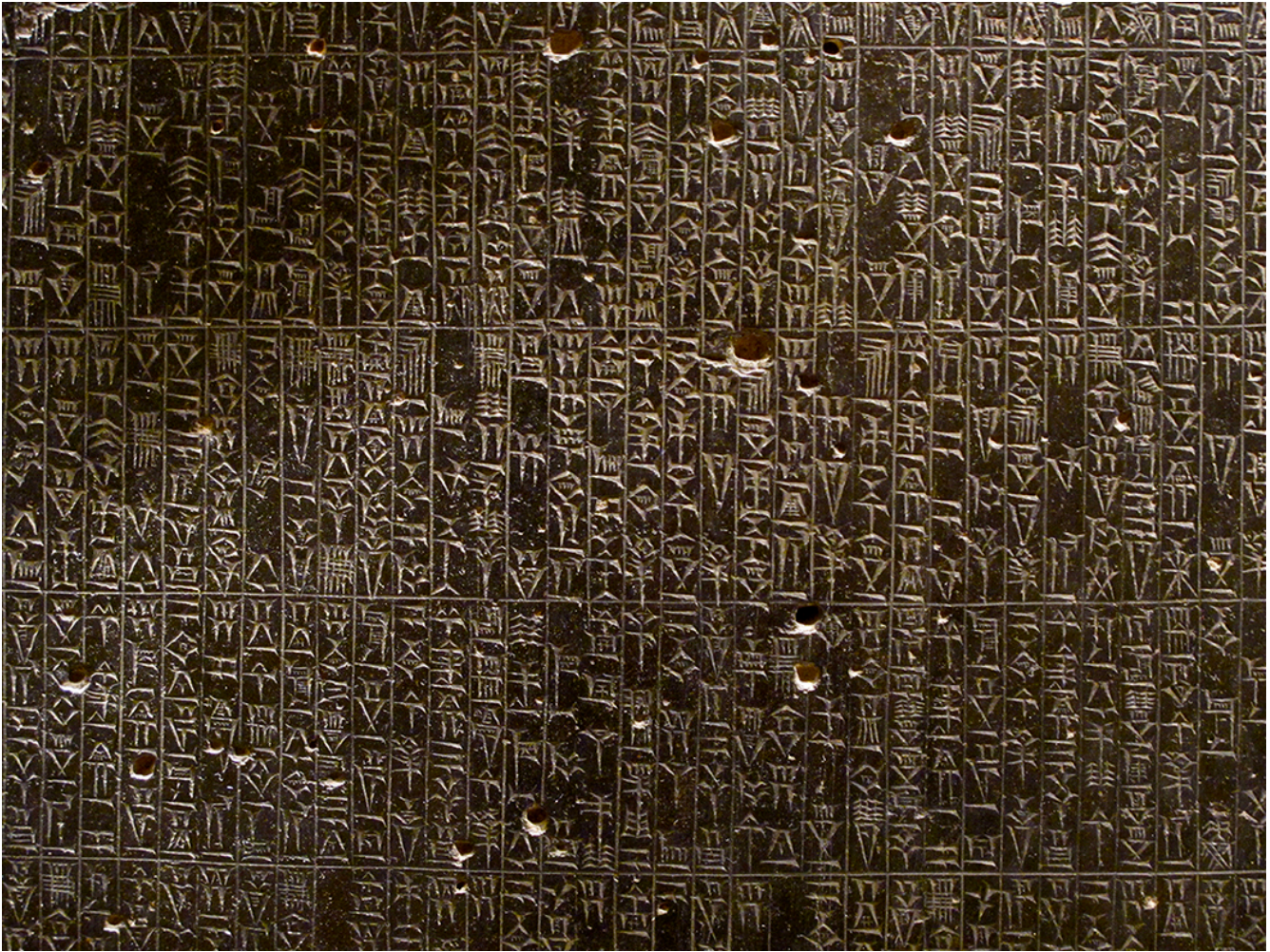
What made this level of trade and economic activity possible? The introduction of writing made it possible for merchants to keep track of various trades. And the development of a basic form of coins allowed for increased trade because a person wanting to obtain a good or service no longer had to find another person who wanted exactly the good or service he produced. Coordinating the activities of those who provided goods and those who wanted to purchase them often required coordination, one of the main functions of a manager.

Early Contributor	Outcome
Sumerians	Writing and trade
Hammurabi	Written commands and controls
Nebuchadnezzar	Incentives
Ancient Egyptians	Division of labor, coordination and span of control
Sun Tzu	Division of labor, communication and coordination
Han dynasty (206 BC–220 AD)	Development of bureaucracy
Ancient Greeks	Division of labor
Romans	Standardization
Italians	Accounting, corporations, multinational corporations
John Florio	Management to English language
Source: Adapted from George (1972) and Wren & Bedeian (2009)	

Table 3.1 (Attribution: Copyright Rice University, OpenStax, under CC-BY 4.0 license)

Two additional contributions to the early development of management came from the Middle East. The idea of written laws and commands comes from the Babylonian king Hammurabi (1810 BC–1750 BC).<sup>4</sup> The Code of Hammurabi was a listing of 282 laws that regulated a wide variety of behaviors, including business dealings, personal behavior, interpersonal relations, and punishments. Law 104 was one of the first instances of accounting and of the need for formal rules for managers and owners. The code also set wages for doctors, bricklayers, stonemasons, boatmen, herdsman, and other labors. The code did not, however, include the concept of incentive wages because it set wages at a fixed amount. The idea of incentives would come from another, much later, Babylonian king, Nebuchadnezzar (605 BC–c. 562 BC),<sup>5</sup> who gave incentives to cloth weavers for production. Weavers were paid in food, and the more cloth they produced, the more food they were given.





The Code of Hammurabi is a well-preserved ancient law code, created between 1810 BC and 1750 BC in ancient Babylon. It's a listing of 282 laws that regulated conduct on a wide variety of behaviors, including business dealings, personal behavior, interpersonal relations, and punishments. Law 104 was one of the first instances of accounting and the need for formal rules for owners and managers. (Gabrielle Barni / flickr/ Attribution 2.0 Generic (CC BY 2.0))

The ancient Egyptians made great strides in the building of the great pyramids. The ancient Egyptians were exceptional builders of canals, irrigation projects, and the pyramids, royal tombs whose size and complexity exceeded what the Greeks and Romans<sup>6</sup> were able to build in later centuries. Although we are still uncertain about exactly how the pyramids were constructed, we have some idea that the process required a great number and wide range of slave laborers to construct them. Each laborer would have a different task. Some of the laborers were stonemasons; others were required to push and pull gigantic blocks of stone; still others were required to grease the stones to reduce friction. In this process, we see the management principals of division of labor, coordination, and specialization. These groups of workers were supervised by one individual. In figuring out how best to handle the huge numbers of workers engaged in pyramid building, the ancient Egyptians also pioneered the concept of span of control, that is, the number of workers that a manager controls directly. Anticipating research on this issue in the far, far distant future, Egyptians found the ideal number of workers per supervisor to be ten. In addition, there were various overseers, who had the responsibility to compel workers to produce.

In Asia, the Chinese began to develop the idea of bureaucracy. Bureaucracy has roots in the early dynasties but only became fully developed during the Han dynasty (206 BC–220 AD).<sup>7</sup> The idea was to train scholars in Confucian teachings

and use those teachings to make decisions. Unlike modern bureaucracies, this system was not formal but relied upon the discretion of the scholars themselves. Another important development was the idea of meritocracy because selection for and then promotion within a bureaucracy was based on a test of Confucian teaching.

The Greeks (800 BC–400 BC) and Romans (500 BC–476 AD) added a number of important steps in the development of management. Although neither empire was commercially oriented, both Greeks and the Romans undertook a wide range of industrial projects, such as roads and aqueducts, and established various guilds and societies that encouraged trade. The Greeks continued to develop the idea of division of labor based on Plato's recognition of human diversity. The great Greek philosopher Socrates stressed the development of managerial skills such as creating an atmosphere of information sharing and analysis. The Romans' contribution to management was standardization. Because the Romans needed to administer a vast empire, they needed standardization of measures, weights, and coins. Romans also saw the birth of the corporation, in that many Roman companies sold stocks to the public.

Both Greece and Rome saw the continued pestilence of slavery, but due to economic changes that made slavery financially unfeasible, workers were gaining some degree of freedom. They still had masters who determined at what jobs they could work and how those jobs should be done. After the collapse of the Roman Empire, there was a decline in European trade. Scholars refer to this time as the Dark or Middle Ages (500 AD–1000 AD), due its location between the classical world of the Greeks and Romans and the world of the Renaissance. While there was little trade or economic development in Europe during this period, trade flourished in the Muslim and Chinese worlds. Various travelers, such as 13th-century Italian merchant and explorer Marco Polo, provided readers with tales and goods from those booming societies.

## CONCEPT CHECK

1. What were the contributions of the following groups to modern management: Sumerians, Babylonians, Egyptians, Chinese, Greeks, and Romans?

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# 10. The Italian Renaissance

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## 2. How did the Italian Renaissance affect the progression of management theory?

In the 11th, 12th, and 13th centuries, Europeans went on a series of military expeditions to recover the Holy Land from the Muslims. These expeditions, called the Crusades, brought wealth and technological advances into Europe from the Muslim world.<sup>8</sup>

In the 14th century, a movement of cultural change and astounding achievements in all spheres of life began in northern Italy. The Italian Renaissance saw the reintroduction of classical knowledge and the emergence of new knowledge and learning, much of which had economic and business implications. The emergence of the basic printing press allowed for these ideas and knowledge to spread throughout Europe. The combination of these factors led to the creation of new wealth as a new emphasis on trade and wealth creation developed. In Italy, we see the emergence of modern enterprise and the emergence of the need for people to run these new enterprises. As Muldoon and Marin<sup>9</sup> write:

Their industrious countrymen were improving mining operations and developing the shipping and banking industries, which created the underlying conditions for the migration of the Italian Renaissance's commercial and intellectual culture from its native Italian soil (Haynes, 1991). The increasing scope and complexity of these commercial activities may well have prompted such inventions as double-entry bookkeeping and motivated companies to hire business managers to coordinate and direct their operations (Witzel, 2002).

Organizations called corporations developed to carry out these commercial activities, not only within a country, but among many countries. The first multinational corporations were located in Italy but had branches across Europe. The Florence Company of Bardi was a multinational bank that provided loans to various kings, including Edward III of England.<sup>10</sup> As their commercial enterprises flourished, the Italians provided manuals for merchants, which spread the ideas of commerce throughout Europe.

## CONCEPT CHECK

1. What was the Italian Renaissance?
2. What managerial legacy did it leave?

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# II. The Industrial Revolution

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## 3. How did the Industrial Revolution affect the progression of management theory?

The Renaissance and its ideals came to England, a backwater power at the time, during the reign of the Tudors (1485–1603).<sup>11</sup> It was during this time that the word *management* came into the English language from Italy through translations by John Florio,<sup>12</sup> an Anglo-Italian member of Queen Elizabeth's court.

The emergence of British power would spawn the third major advance in management, the Industrial Revolution. As the British Empire's power grew, so did opportunities for trade. The 18th century saw the emergence of various international corporations, such as the Hudson's Bay Company<sup>13</sup> and the East India Company,<sup>14</sup> which conducted business globally. The Hudson's Bay Company orchestrated fur trade in Canada where pelts were produced and then shipped to England for trade in any part of the globe.

This further development of trade led to the establishment of the marketplace as a dominant means of organizing the exchange of goods. The market would coordinate the actions and activities of various participants, thus allowing resources to flow to their most efficient uses. One of the major intellectual leaders of this period was the economist and moral philosopher Adam Smith.<sup>15</sup> In his masterpiece, *The Wealth of Nations*,<sup>16</sup> Smith proposed the idea of specialization and coordination within corporations as a source of economic growth. Specialization and division of labor were Smith's major contributions to management thought. The division of labor meant that a worker specialized in performing one task that was part of a larger series of tasks, at the end of which a product would be produced. The idea of specialization of labor had several important outcomes. Firstly, specialization drastically reduced the cost of goods. Secondly, it drastically reduced the need for training. Instead of learning every aspect of a task, workers needed to learn one portion of it. Thirdly, the need to coordinate all these different tasks required a greater emphasis on management.

Another significant part of the Industrial Revolution involved the development of the steam engine, which played a major role in improving the transportation of goods and raw materials. The steam engine lowered production and transportation costs, thus lowering prices and allowing products to reach more distant markets.<sup>17</sup> All of these factors played a role in the Industrial Revolution, which occurred between 1760 and 1900.<sup>18</sup> The Industrial Revolution saw the emergence of the modern corporation, in which work, usually in a factory setting, was specialized and coordinated by managers.

Prior to the Industrial Revolution, goods and services lacked standardization and were produced at home in small batches.<sup>19</sup> The Industrial Revolution saw work shift from family-led home production to factory production. These factories could employ hundreds and even thousands of workers who produced mass batches of standardized goods more cheaply than they could be produced in homes.

Factory sizes ranged from sections of cities and towns to whole cities, such as Lowell, Massachusetts, which consisted primarily of textile mills. As the Industrial Revolution progressed, small factories transformed into larger ones. In 1849, Harvester in Chicago employed 123 workers and was the largest factory in the United States. McCormick plant by the mid-1850s had 250 workers who made 2,500 reapers per year. After the Great Chicago Fire, McCormick built a new plant with 800 workers and sales well above \$1 million. In 1913, Henry Ford's plant in Dearborn employed up to 12,000 workers.<sup>20</sup> As factories grew in size, they provided chances for personnel fulfillment. Not only was the Hawthorne plant in Cicero, Illinois, a place of business, but it also featured sports teams and other social outlets.<sup>21</sup>

The Industrial Revolution shifted from England across the globe and eventually found its way into the United States. The United States starting seeing several notable industrial revolutions from the 1820s until the 1860s. The transportation revolution included the construction of canals and, later, railroads that connected the different parts of the continent. The emergence of a telegraph system allowed for faster communication between various parts of the United States. Previously, it would take weeks to get information from New York to Boston; with the telegraph, it took minutes.<sup>22</sup> The United States also saw the emergence of the Market Revolution. Previously to the Market Revolution, the

U.S. economy had been based on small, self-subsistent yeoman farmers who would produce mostly homemade batches. Around 1830, the existence of easy credit and improved transportation established a broad Market Revolution. This spawned a wide variety of corporations that needed managers to coordinate various company offices.<sup>23</sup>

After the period of the American Civil War, which ended in 1865, society witnessed the emergence of gigantic corporations that spanned the continent and factories that were like small cities.<sup>24</sup> Various problems emerged due to the change of production (similar to some of the issues we face today with the change from a manufacturing economy to an information economy). For example, how do you motivate workers? When families controlled labor, it was very easy to motivate workers due to the fact that if family members did not produce, the family may not survive.<sup>25</sup> Yet in the factory, it was possible for workers to avoid work or even destroy machines if they disliked management's ideas. Each worker did the job in a different fashion, workers seemed to be selected without regard to whether they were suited for a particular job, management seemed to be whimsical, and there was little standardization of equipment.

Because production quantity remained an unknown to both management and the worker, management did not explain how they determined what should be produced. Workers believed that management determined what should be produced in haphazard ways.<sup>26</sup> Workers believed that if too much were produced, management would eliminate workers because they believed that there was a finite amount of work in the world. Workers would control production by punishing those workers who produced too much. For example, if a worker produced too much, his equipment would be damaged, or he would be brutalized by his coworkers. Methods of production were similarly haphazard. For example, if you learned how to shovel coal or cut iron, you learned multiple ways to perform the job, which did little for efficiency. Due to managerial inefficiency, various reformers in engineering urged for the establishment of management as a distinct field of study so that some order and logic could be brought to bear on how work was performed. Although this period witnessed enormous changes in technology, management was still lagging behind.<sup>27</sup>

## CONCEPT CHECK

1. Why was Adam Smith's specialization of labor so important?
2. What was the economic and managerial legacy of the Industrial Revolution? What were the challenges?

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## 12. Taylor-Made Management

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4. How did Frederick Winslow Taylor influence management theory, and how did efficiency in management affect current management theory?

The economic upheaval of the Industrial Revolution also witnessed tremendous social upheavals. The U.S. professional classes (lawyers, administrators, doctors) had numerous concerns.<sup>28</sup> Because more and more people were now working in factories, there was the potential for creating a permanent underclass of poorly educated workers struggling to make a living. Many reformers felt that workers could be radicalized and actively try to better their working conditions, pay, and so on, thus disrupting the status quo of the labor markets, leading to strikes, riots, violence. There were also concerns that money, influence, and pressure from big business were corrupting politics and overriding the will of the people.

The working class had many concerns about their work life. As mentioned earlier, there was a deep fear that work would disappear because of overproduction. There were also concerns over wages, job tenure, and workplace justice. And there was little in the way of standardization when it came to how tasks were to be accomplished.<sup>29</sup> When Frank Gilbreth, a pioneer in scientific management, was apprenticed as a bricklayer in 1885, he noted that he was taught three ways to lay bricks even though there was no need for more than one method.

In the factories, there was little concern for the workers' physical or mental health, and there were no breaks.<sup>30</sup> Management and the workforce were in vicious contention with each other. Management would set the rate of work expected for the day, and in response, workers would band together to limit production. This action, called "soldiering," was a deliberate reduction of productivity on the part of the worker. Those workers who either over- or underproduced could expect that their equipment would be destroyed or that they themselves would be physically harmed. There were very few, if any, incentives provided by management. When managers sought to motivate workers, they did so through physical beatings and other punishments.<sup>31</sup> Neither side had a reason to trust or cooperate with the other.

Compounding management problems, there was now a demand for managers, but there were very few of them to fill this demand, as there was little training provided. Prior to the Industrial Revolution, companies were largely in the hands of a family or a single owner/manager. As companies were getting larger and more complex and the exchange of goods was taking place across more and more regions, most business owners no longer had the expertise to run such vast geographic and financial enterprises.<sup>32</sup> Yet there was little in the way of management training or education. There were no established scholarly journals, such as the *Academy of Management Journal*, or practitioner journals, such as the *Harvard Business Review*. Nor were there business schools until 1881, when the Wharton School of Business at the University of Pennsylvania was established. Business education at this time consisted mostly of classes that taught secretarial work. Allied fields, such as psychology and sociology, were in their infancy. Any management education that did exist was mostly learned from lessons of history and literature. Although there were numerous examples of both excellent and terrible management, this education was anecdotal and not systematic.

The second phase of the Industrial Revolution commenced with the establishment of management as a distinct discipline of knowledge. Management's birth was not in Great Britain, but in the United States.<sup>33</sup> According to management consultant and educator Peter Drucker, the development of management was one of the United States' primary contributions to the world, along with the Declaration of Independence.<sup>34</sup> At the same time management was getting established, sociology and psychology were developing, and the studies of history and economics were becoming more scientific and formal. Management also became formalized as a field of study using the scientific method. Drucker stated that the development of management was one of the factors that held off the development of radicalism in the United States because it increased productivity, lowered prices, and increased wages for workers. The

success of scientific management lifted workers into the middle class. This crucial development has been attributed to one person in particular: Frederick Winslow Taylor.

Frederick Winslow Taylor (1856–1915) is known as the father of scientific management. He was born to the Quaker aristocracy of Pennsylvania, and initially he planned to go to Harvard and become a lawyer or an executive until he suffered an eye injury that prevented him from reading.<sup>35</sup> With Harvard no longer an option, Taylor went to work at a family friend's factory, the Midvale Steel Company. Taylor took to the work and was promoted quickly from pattern maker to foreman and then to chief engineer. During this time, he witnessed many acts aimed at limiting or reducing production—including having his tools destroyed—and it was he who coined the term *soldiering* to describe this deliberate act.<sup>36</sup> Rather than stand by and see such senseless acts affect the business he worked for, Taylor decided to take action. First, he went to Stevens Institute of Technology to gain a background in engineering. Then he took this knowledge and applied it to his work.

It is important to note that Taylor was not an original thinker. Many of his ideas came from other thinkers, especially the Englishman Charles Babbage (1791–1871).<sup>37</sup> Taylor's contribution was that he advanced a total system of management by uniting the ideas and philosophies of many others. While he may not have invented the scientific study of management, Taylor contributed to the use and synthesis of management by pioneering the use of time studies, division of labor based on function, cost-control systems, written instruction for workers, planning, and standardized equipment. Taylorism is still the basis of modern management, including the use of incentives. For example, Taylor stressed piecework production, meaning that workers were paid for how much they produced. Taylor also stressed the idea of differential piecework, meaning that if workers produced more than a certain amount, they would be paid more. Some compensation systems, such as sales commissions (i.e., being paid for how much you sell), have their bases in Taylor's work.

Taylor's major contribution was that he prized knowledge and science over tradition and rules of thumb. He broke down each act of production into its smallest parts and watched the best workers perform their jobs. Using a stopwatch to time the workers' actions, Taylor determined the most effective and efficient way to accomplish a given task. After breaking down each job into its component parts, Taylor then reconstructed them as they *should* be done. Taylor also developed time management studies to break down a person's workday into a series of activities. He then timed the execution of each activity to see which way was the quickest. He would rebuild the job using only the most efficient ways possible and then train workers to perform the task. And by allowing workers to have rest periods throughout the day, he was able to get workers to work faster and better without making them tired.<sup>38</sup>

Another one of Taylor's significant contributions to the practice and profession of management was the concept of first-class work. When Taylor developed the notion of first-class work, he did so with the idea that workers should do as much work as they are physically and mentally capable of doing. Those who were not physically or mentally capable of keeping up with production and job demands were sent to different areas in the plant where they could work most effectively. First-class work was based not on physical strain or bursts of activity, but on what a worker could realistically be expected to do.

Taylor also developed a task management system that allowed work to occur more efficiently and allowed for breaking up a supervisor's work so that he could function within a discrete area of activities. This focus allowed supervisors to better plan and control the activities for which their workers were responsible. Taylor believed that managers would become better at and more suited to analyzing their specific area of expertise, with authority that came from knowledge and skill and not simply from position or power. He also developed a cost-accounting method that became an integral part of daily planning and control, not something that was applied only to long-term analysis.

Taylorism was based on **four principles of management** illustrated in **Table 3.2**.

Principle 1: A manager should develop a rule of science for each aspect of a job. Following this principal ensures that work is based on objective data gathered through research rather than rules of thumb. For example, many people believed that allowing workers to take breaks would limit how much work could be done. After all, how could a worker produce if he was not working? Taylor changed this attitude through research that demonstrated the benefits of breaks during the workday. Due to Taylor's research, we now enjoy coffee breaks.

Principle 2. Scientifically select and train each worker. When you get to the chapter on human resource management,

you will see that Taylor's ideas still hold. Prior to Taylor's work, the selection of workers was made based on favoritism, nepotism, or random choice. Taylor got his job at Midvale because the owner was his father's friend. Likewise, workers were usually selected for a particular job with little consideration of whether they were physically or mentally fit to perform it. Taylor changed this viewpoint by using research to find the best worker for the job.

Principle 3. Management and the workforce should work together to ensure that work is performed according to the principles of management. Taylor's observation went against the long-established principles of both management and the worker who believed that each was the other's enemy. Rather than enmity, Taylor stressed cooperation and the need for the work relationship to be mutually beneficial.

Principle 4. Work and responsibility should be equally divided between management and workers. Previously, management set the directives, and workers obeyed or blocked them. Taylor believed that management and workers had joint responsibilities to each other. Management's responsibility was to scientifically select the quantity of output for the day and provide a fair wage. In return, workers were to provide a fair day's work.

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### Principles of Scientific Management

First. They develop a science for each element of a man's work, which replaces the old rule-of-thumb method.

Second. They 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. They heartily cooperate with the men so as to ensure all of the work being done 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 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.

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Table 3.2 (Attribution: Copyright Rice University, OpenStax, under CC-BY 4.0 license)

## Taylor's Acolytes

In addition to his groundbreaking work on scientific management, Taylor attracted a wide variety of talented individuals who aided him in his research. The first important individual was the mathematician Carl G. Barth (1860–1939). Barth made two notable contributions. The first was his work on employee fatigue. He attempted to find what aspects made a worker tired. The second was his use of the slide rule for calculating how much steel to cut. A slide rule is a ruler with a sliding central strip. It makes it possible to perform calculations rapidly and accurately. Barth developed one for cutting steel. Before Barth's work, workers were required to make difficult calculations to determine how much steel to cut. Usually, they guessed, which led to a lot of errors and waste. With the slide rule, however, the number of errors decreased, as did the costs associated with them.

Another notable contributor to Taylor's methods was Henry Gantt (1861–1919), who developed the Gantt chart, which allowed for greater and more precise control over the production process. The Gantt chart, illustrated in **Exhibit 3.4**, tracked what was supposed to be done versus what was actually done. Gantt gives two principles for his charts: First, measure the amount of time needed to complete an activity. Second, use the space on the chart to visually represent how much of an activity should have been completed in that given time. Today, the closest thing to a Gantt chart is a scheduling system. These charts allowed management to see how projects were progressing, take steps to see if they were on schedule, and monitor budget concerns.<sup>39</sup> Gantt also pioneered the employee bonus system, in which employees were given a bonus if they completed the task they were assigned.



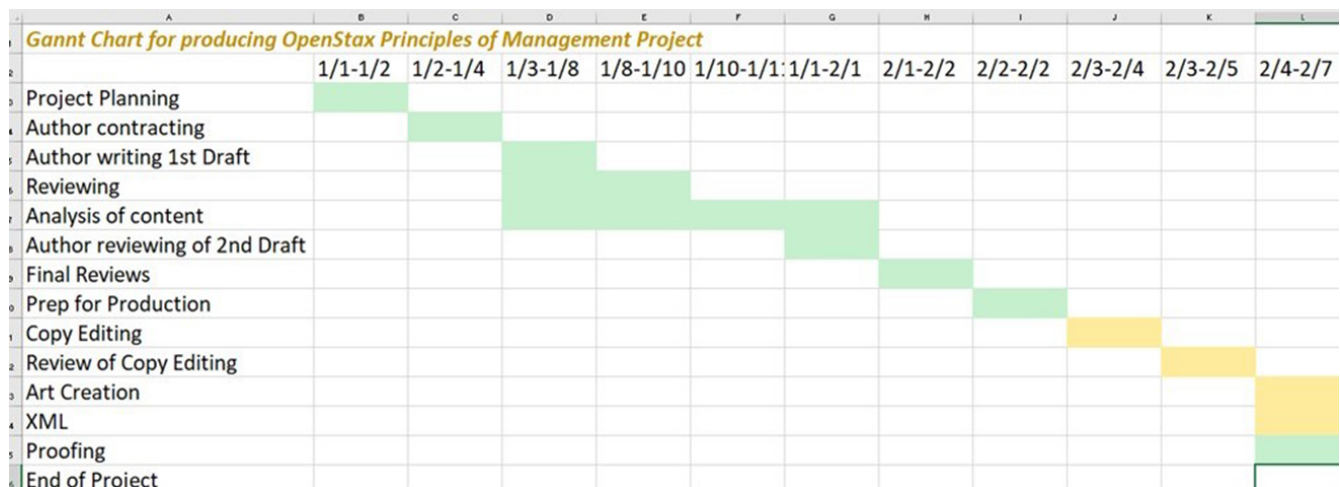


Exhibit 3.4 Gantt Chart Attribution: Copyright Rice University, OpenStax, under CC BY-NC-SA 4.0 license

The next key contributors to Taylor's system of scientific management were Frank (1868–1924) and Lillian Gilbreth (1878–1972),<sup>40</sup> a couple that sometimes competed with and sometimes worked with Taylor. Frank Gilbreth was a bricklayer who, before he heard of Taylor, began to find ways to limit his fatigue and more efficiently lay down more bricks. Unlike Taylor, Gilbreth was concerned with motion studies, in which he would film various motions while someone worked on the job. To determine the most efficient way to perform a task, for example, Gilbreth reduced all motions of the hand into some combination of 17 basic motions. Gilbreth would then calculate the most efficient way of carrying out a job. Gilbreth filmed workers performing a wide variety of jobs, including bricklaying, secretarial duties, and even a baseball game.

When working in construction, Gilbreth developed a management system that included rules about no smoking on the job, a ten-dollar prize for the best suggestion in how to improve labor, and a new system of training so that workers were taught only the best way to perform a task. He developed a rule that all accident sites be photographed for use in future lawsuits. Gilbreth also prepared employees for their present and future positions by introducing a plan for promotion, training, and development. This system required charting promotion paths and record keeping for performance appraisals. He wanted to impress upon both workers and managers an understanding of fatigue and of how to improve pay. In his research, Gilbreth realized that monotony came not from the job itself, but from a worker's lack of interest in the job.

Lillian Gilbreth may not have been the originator of the industrial psychology movement, but she brought a human element into the study and practice of management with her training and insight. She stated that to understand how to work better, we must understand the worker. Under scientific management, for example, understanding the worker became a fundamental principle in selecting workers for particular tasks and providing workers with incentives. The object was to develop each person to his fullest potential by strengthening his personal traits, special abilities, and skills. After Frank Gilbreth died, Lillian Gilbreth shifted her focus to increasing domestic efficiency and, in the process, designed the modern kitchen.

## Taylor's Shortcomings

Taylor was a monomaniac on a mission to convert as many people to scientific management as possible. Yet despite his conviction and zealousness, Taylor's ideas were poorly understood, and he attracted more enemies than followers.<sup>41</sup> Taylor attracted enmity from unions because he was against them; he believed that unions separated workers from management. Taylor attracted enmity from the workers because he compared them to apes and other beasts of burden.

And Taylor gained the distrust and enmity of management because he criticized them for their previous management failures. Taylor had a difficult personality and angered just about everyone.

Additionally, Taylor made several mistakes. Taylorism, despite its claims, was not an overall theory of management, but a management system designed for frontline managers, those immediately supervising. He generally ignored strategy and implementation and thought of workers as machine tools to be manipulated rather than as human beings. Although he was aware of group pressures, he believed that monetary incentives could overcome group pressures. This oversight made him ignore the human aspects of handling workers, those that involved emotions, personality, and attitudes.

While Taylor was certainly a flawed individual, these criticisms do not diminish his great contributions. Taylor dramatically changed management practices and created the modern management world. Future researchers did not replace Taylor, but complemented him. What is remarkable about Taylor was not that he was right in his time and place, but that his vision continues to have meaning and consequence even today.<sup>42</sup> Management was truly Taylor-made.

## CONCEPT CHECK

1. List the contributions from Taylor and his associates.
2. How did Taylor change management?

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# 13. Administrative and Bureaucratic Management

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## 5. How do bureaucratic and administrative management complement scientific management?

Writing at the same time as Taylor, Henri Fayol (1841–1925) and Max Weber (1864–1920) wrote complementary contributions to Taylor’s four principles of scientific management framework. Whereas Taylor focused on frontline managers, those who handle workers, Fayol focused on top managers, who set strategy, and Weber focused on middle managers, who implement strategy. Although Taylor, Fayol, and Weber viewed management from different perspectives, each stressed the need for logical, rational systems to coordinate and control various types of enterprises.

Henri Fayol was a French mining executive who did the majority of his scholarly work after the Franco-Prussian War of 1870–1871.<sup>43</sup> Fayol sought to develop a theory of administrative theory in order to increase efficiency in order to make the French economy stronger. Like Taylor, Fayol prized knowledge and experience over tradition. Unlike Taylor, however, Fayol focused on overall management of the corporation rather than on individual tasks involved in carrying out a firm’s business. Fayol focused on the overall social interactions [between or within what? a company and between companies? or just within a company?] the company. An explanation for this difference is that Taylor was concerned with worker behavior and performance, the domain of the frontline manager. Fayol’s focus was on the direction and coordination of the whole organization, which is the domain of the top manager.<sup>44</sup> Another notable difference between the two men was that Taylor emphasized monetary compensation while Fayol recognized that people work for things other than money. Fayol’s greatest contribution was that he sought to develop an approach that would aid top managers in setting the direction of their company.

Fayol presented three principal ideas about management.<sup>45</sup> First, Fayol stressed the need for unity of command, that is, that a company’s management should speak with only voice. Too often under the Taylor system, a worker could have up to eight managers telling him how to perform a single task. Fayol stressed flexibility and recognized that authority must have responsibility attached to it. Accordingly, he stressed that management should maintain a unity of command, which ensured that each supervisor would explain to each of the employees in his group or division what aspect of his job to focus on. Each supervisor receives direction and information from the managers above him and passes that information down the chain of command.

Fayol’s second notable contribution was his recognition that workers focused on the social aspects of their jobs as well as on the monetary compensation they received for doing the job. Taylor was well aware of the social aspects and pressures of work, but he sought to limit them. Fayol sought to use them for the business’s benefit by stressing the development of an *esprit de corps* among workers. *Esprit de corps* refers to the cohesion of workers in a given unit or department, to their commitment to their individual goals and to their coworkers even in the face of adversity, and to the pride that one feels by being a member of the organization. Fayol stressed communication as a means of creating *esprit de corps* and building commitment between personal goals and organizational goals.

A third important aspect of Fayol’s work was his emphasis on the notion of justice within an organization and on the idea that an organization must decide issues fairly and equitably. In this way, managers could limit the ways in which their biases and personal feelings could influence their decisions.

Taken as a whole, Fayol’s ideas became what we call today Fayolism, or administrative theory. Fayolism consists of the 14 principles of management. The 14 principles articulate the types of tasks that managers are supposed to do. These 14 principles are still used today, but how they are used varies with a firm’s use of technology and its culture. For example, a society that stresses individual outcomes will have different compensation systems than those that are focused on collective or group outcomes.

Fayol’s 14 Principles of Management are:

### 1. Division of Work

2. Authority
3. Discipline
4. Unity of Command
5. Unity of Direction
6. Subordination of Individual Interest
7. Remuneration
8. Centralization
9. Scalar Chain
10. Order
11. Equity
12. Stability of Tenure of Personnel
13. Initiative—Employees should be given the necessary level of freedom to create and carry out plans.
14. Esprit de Corps

In addition to the 14 principles, Fayol identified the five functions of management:

1. Planning
2. Organizing
3. Staffing
4. Controlling
5. Directing

Each of these functions describes what managers should do on a day-to-day basis. The functions of management have changed over the years but have built upon Fayol's structure. Fayol fully described what a manager does and how each activity builds off of the others.

Max Weber was a German sociologist who made significant complementary contributions to Taylor's management system as well as to the disciplines of economics and sociology. Weber did the majority of his work in the early 1890s and then after 1904 when he started writing again. Sociologists hold Weber in such esteem that they regard him as a father of the field.

Weber<sup>46</sup> stressed that social scientists could only understand collectives by understanding the actions of individuals. One of the individual behaviors that Weber did research was the types of leadership, identifying three types of leadership: charismatic domination (familial and religious) traditional domination (patriarchs, patrimonialism, and feudalism) and legal domination (modern law, state, and bureaucracy). Weber's contribution to management is the development and understanding of the legal rationalism model of leadership, which stressed the idea that leaders should make decisions based on law, precedent, and rule, rather than whim. Weber went further than previous scholars and described why we saw the emergence of bureaucracies and other responses to industrialization.

According to Weber, both the industrialization and transportation revolutions allowed for the expanse of territories to be managed. The demands placed on managing larger and larger amounts of territory as well as people facilitated the need for bureaucracy, which is a system of fixed rules that are impartially administered. The expanding market economy required administration that is more efficient. At the same time, the emergence of communication and transportation improvements made improved administration possible.

The most notable contribution Weber provided to modern management was the creation of the modern bureaucracy. Weber's principles of the ideal bureaucracy are shown. Although the ancient Chinese had the first bureaucracy, the notable difference of Weber's bureaucracy is that decisions were made on a formal basis, rather than what a manager felt was correct. Weber stressed that knowledge, not birth circumstances, should be the basis of hiring and promotion within a bureaucracy. This attitude stood in sharp contrast to the policies and practices of the time in both Europe and the United States, which stressed birth circumstances. Weber also stressed that bureaucrats need to make decisions based on rules rather than whims. The word *bureaucracy* has negative connotations in the mind of the modern reader,

but it was a vast improvement over what had occurred previously. Prior to Weber, management did not have to provide justification for why they made particular decisions, nor did they have to make decisions based on rules. Hiring and promotion were based on nepotism, very different from the modern meritocracy of today.

Principles of the Ideal Bureaucracy:

- Specialized roles
- Recruitment based on merit
- Uniform principles of placement, promotion, and transfer
- Careerism with systematic salary structure
- Hierarchy, responsibility, and accountability
- Subjection of official conduct to strict rules of discipline and control
- Supremacy of abstract rules
- Impersonal authority (i.e., office bearer does not bring the office with him)

There was, however, a downside to this new managerial approach. A bureaucracy could shield bureaucrats from personal responsibility and initiative. Even worse, it could make them willing participants in criminal activities. American sociologist Robert K. Merton noted that in a bureaucracy, rules could become more important than actual goals. Merton wrote:

An effective bureaucracy demands reliability of response and strict devotion to regulations. (2) Such devotion to the rules leads to their transformation into absolutes; they are no longer conceived as relative to a set of purposes. (3) This interferes with ready adaptation under special conditions not clearly envisaged by those who drew up the general rules. (4) Thus, the very elements which conduce toward efficiency in general produce inefficiency in specific instances. Full realization of the inadequacy is seldom attained by members of the group who have not divorced themselves from the meanings which the rules have for them. These rules in time become symbolic in cast, rather than strictly utilitarian.<sup>47</sup>

Another particular issue was that bureaucracy placed so much emphasis on legal authority that it ignored several important factors. The first factor is that bureaucratic laws are often incomplete due to problems in communication and understanding. Contracts tend to be abandoned rather than completed. No contract or law can consider every outcome or event. The second issue is that bureaucratic organizations ignored interpersonal authority and often relied only on reason and logic for decision-making. Often people followed their managers because they personally liked them rather than the legal aspect of authority. Managers that only use legal authority to gain performance are going to be really limited in the performance they will be able to garner (please see the chapter on leadership).

Both Fayol and Weber made significant contributions to management. Fayol's ideas are the basis of modern strategy, as he attempted to understand what activities managers should do. His ideas inform management thoughts in terms of the various roles that managers need to undertake to ensure the cooperation of workers. Likewise, Weber's ideas can be seen very clearly in human resource management in that managers should make decisions based on policy rather than whim. We can see that both men's ideas about structure and the line of authority continue to have great influence in management today.

## CONCEPT CHECK

1. What were the contributions of Fayol and Weber?
2. How did their work compare to Taylor's?
3. What is the idea of line of authority and structure?

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# 14. Human Relations Movement

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6. How did Elton Mayo influence management theory, and how did the human relations movement affect current management theory?

The human relations movement was a natural response to some of the issues related to scientific management and the under-socialized view of the worker that ignored social aspects of work. The key uniting characteristics of Taylor, Weber, and Fayol were the ideas of efficiency produced through either operational, legal, or administrative improvements. One of the principal assumptions was an emphasis on rationality.<sup>48</sup> According to scientific management, there was a logic to actions, and formal and knowledge authority were the principal catalysts of workplace motivation. Scientific management tended to downplay the effects of social pressures on human interactions.<sup>49</sup> The human relations movement enhanced scientific management because it acknowledged that peoples' attitudes, perceptions, and desires play a role in their workplace performance. With this acknowledgement, for example, managers began to realize that settling disputes was more difficult than the scientific management approach described.

The major difference between scientific management and human relations theory was that human relations theory recognized that social factors were a source of power in the workplace. While Taylor recognized the existence of social pressures in an organization, he sought to diminish them through pay, that is, compensating workers for production even though social pressure forced workers to reduce production. Fayol recognized the existence of social issues as well, but he emphasized commitment to the organization as a management technique rather than commitment of workers to each other or to their supervisor. Weber placed emphasis on the rule of law and believed that laws and regulations would guide society and corporations. Yet he did not spend enough energy recognizing the outcomes that happen when rules break down. Fayol and Weber did not recognize the role of corporate culture in an organization and did not examine more closely why workers do not follow orders. The human relations movement added more of the social element to the study and theory of work.<sup>50</sup>

Perhaps no research studies have been as misunderstood as the Hawthorne studies. The Hawthorne studies are the most influential, misunderstood, and criticized research experiment in all of the social sciences. The legend goes that Elton Mayo (1880–1949) researched, theorized, and developed human relations theory based on a 1924–1932 experiment he conducted at the Hawthorne plant of the Western Electric Company in Cicero Illinois. However, there is very little of the legend that is true. The truth is more complicated and difficult to understand. Most textbooks claim that Mayo researched and conducted the studies. Yet this is fiction. The studies were commenced by scholars from the Massachusetts Institute of Technology. Mayo did not become involved until 1927. Nevertheless, it is Mayo's vision of Hawthorne that has come to dominate the literature.

The first phase of the Hawthorne studies was called the illumination study, and it sought to measure the impact of light upon productivity. The study was inconclusive because there were too many variables other than light that could have affected worker productivity. The researchers had difficulty understanding why productivity increased. The second phase of the study was called the relay-assembly-test-oom, and these experiments were carried out in a room where researchers tested the effect that working conditions such as breaks, length of the workday, company-provided lunches, and payment method had on productivity. They selected six young female workers to be part of a team that produced a phone relay switch. Each woman was young and unlikely to be married any time soon. One woman was assigned to gather the parts to make the switch, and each of the other five women was assigned to assemble one component of the phone relay. The researchers found that production increased regardless of what variable was manipulated. Nevertheless, soldiering still occurred during the experiment. After two workers were fired for a health issue and getting married, production increased even more. The results were surprising to the researchers: they had expected to see a reduction but instead saw a consistent increase.

The Hawthorne executives turned to Elton Mayo, an Australian psychologist from Harvard University, to explain

the puzzling results. Most of the controversy regarding the Hawthorne studies stems from Mayo's involvement. Mayo observed that production could be increased if management understood the role of individual workers' attitudes toward work and also took into account how group attitudes affected behavior. Mayo theorized that social issues and attention paid by the supervisor to these issues played a role in increasing production. The Hawthorne women were granted freedoms at work, including the ability to make suggestions regarding their work conditions. Many of the Hawthorne women felt that they were special and that if they performed well on the relay assembly task, they would be treated better by the company's management. Additionally, the Hawthorne women became very friendly with each other. Their connection as a team and increased satisfaction in their work appeared to drive the women to greater performance. Yet the study found that financial incentives were a clear driver of performance as well.

A third study, called the bank wiring room study, was conducted between 1931 and 1932. Rather than being selected to form a new group, participants in the bank wiring room study consisted of an already existing group, one that had a number of bad behaviors. Regardless of financial incentives, group members decided that they would only produce 6,000 to 6,600 connections a day. Workers who produced more were ostracized or hit on the arm to lower production. George Homans summarized the difference in the results of the relay assembly and the bank wiring room experiments:

"Both groups developed an informal social organization, but while the Bank Wiremen were organized in opposition to management, the Relay Assemblers were organized in cooperation with management in the pursuit of a common purpose. Finally, the responses of the two groups to their industrial situation were, on the one hand, restriction of output and, on the other, steady and welcome increase of output. These contrasts carry their own lesson."

Researchers found that cliques were formed that placed informal rules on the workers within a group. According to Homans, the workers also made a connection with one of the managers to control production. The discovery that management could ally themselves with the workforce to limit production was a notable contribution to management thought at the time. It suggests that managerial authority can break down if the manager disagrees with management's policy toward the workers.



Exhibit 3.5 The Hawthorne Electric Plant The Hawthorne studies examined the effects that differences in working conditions (such as the timing and frequency of breaks) had on productivity. The term got its name from the experiments conducted at the Western Electric Hawthorne plant, illustrated here, located in Cicero, Illinois. These studies made popular the idea that attitudes affect performance. Credit: ( public domain / flickr / This work is in the public domain in the United States because it was published in the United States between 1923 and 1977 without a copyright notice.)

What did the studies mean? On some level, they were meaningless because they proved little. Indeed, they have been called scientifically worthless. There were too many variables being manipulated; the sample size was too small; observations were collected at random; the Hawthorne researchers viewed the experiments through their own ideological lenses. They made mistakes in assuming that the wage was insignificant to the workers, when in reality the wage was a significant driving force. Yet these criticisms ignore two major facts about the Hawthorne studies. The first is that the Hawthorne studies were the first to focus on the actual work life of the workers. This was a notable change in sociological research. The second fact is that the studies were intended to generate future research, and future research did discover that attitudes play a major role in determining workplace outcomes. Another important finding concerned the role of the supervisor. Many worker behaviors, attitudes, and emotions have their genesis in their supervisor's actions. Stress and fatigue can be the result of interactions with supervisors and coworkers; they are not



just a response to less-than-ideal physical conditions. Finally, the Hawthorne studies showed that work motivation is a function of a wide variety of factors, including pay, social relationships, meaning, interests, and attitudes.

## Barnard and the “Zone of Indifference”

Chester Barnard (1886–1961) was president of the New Jersey Bell Telephone Company.<sup>51</sup> As president, he was given an unusual amount of time to conduct research. Barnard had been a student at Harvard, and through his connections there, he found out about some of the industrial research going on. His notable contribution was a book called *The Functions of the Executive*.<sup>52</sup> Barnard argued that an executive’s purpose is to gain resources from members within the organization by ensuring that they perform their jobs and that cooperation exists between various groups within the organization. The other notable function of an executive is to hire and retain talented employees. Barnard defined a formal organization as consciously coordinated activities between two or more people but noted that such coordination is not likely to last for very long, a factor that may explain why many companies do not survive for long periods of time.

Barnard believed that executives best exerted authority through communication and the use of incentives. Communication within an organization should include definite channels of communication, and workers should have access to knowledge and information. Communication should be clear, direct, and honest so that members of an organization understand what is expected of them.

Barnard stressed several important outcomes regarding incentives. Some of his incentives reflected the human relations movement’s occupation with social outcomes but tempered that movement’s emphasis with an understanding that workers labored for pay. The first incentive was that there should be monetary and other material inducements to encourage better performance and production. The second incentive was that there should be nonmaterial incentives, such as recognition. The third incentive was that working conditions should be desirable. The fourth and final incentive was that workers should find pride and meaning in the work they do. Barnard believed that a combination of these elements would ensure cooperation and contributions from organizational members.

While his findings on executive functions, communication, and incentives were significant, Barnard’s largest contribution to the study of management involved what he called the “zone of indifference.” The idea behind the zone of indifference is that workers will comply with orders if they are indifferent to them. This does not mean they have to agree with or support the orders. Rather the zone of indifference suggests that workers need merely to be indifferent to an order to follow it and that workers will follow orders due to an individual’s natural tendency to follow authority. The zone of indifference must be reached through the following factors. First, the workers must have the ability to comply with the order. Second, workers must understand the order. Third, the order must be consistent with organizational goals. For both management and the worker to cooperate, their interests must be aligned. Fourth, the order must not violate an individual’s personal beliefs. Barnard provided an explanation for why workers do not always obey orders.

## *Follett and Conflict Resolution*

Mary Parker Follett (1868–1933) found a way to use the tenets of the human relations movement to solve some of the problems with the scientific management framework. Follett was a political scientist from Harvard. (Her work on the Speaker of the House remains the classic in the field.) After graduating from Harvard, given the limited opportunities for women, she wound up in the field of social work. She continued to publish works on philosophy and political science, but, based on her social work connections, she soon found herself drifting over to the Taylor Society, a group dedicated to the principles of scientific management. Later in her career, she turned toward business. As Wren and Bedeian note, chronologically she belonged to the scientific management era, but intellectually she belonged to the human relations movement era.<sup>53</sup>

Follett’s work was largely ignored for years either because it was too original or because she was a woman; it is likely

both factors played a role.<sup>54</sup> Her ideas found little acceptance during the period because in her time, management saw workers only as tools. Her focus was on how to reduce conflict. Follett's contribution was that she pointed out that management should take social concerns into account when dealing with workers. She asked questions of management: How do we create unity of action? How do we help workers live fuller, richer lives? How do we contribute to group success? Her argument was that individual behavior is affected by and affects others in the group.<sup>55</sup> Accordingly, she argued for the need of the principle of coordination to have a continuous interaction of all factors. What she meant was that both management and the worker should be able to understand the other's viewpoint. She sought to have both management and the worker share power with each other, rather than have power over one another. In addition, unlike Weber and more in line with Taylor, she believed that power should be based on knowledge and expertise.

Follett also argued that there are several ways to resolve conflicts. The first is to have one party dominate the other. In dominance, one party dictates the terms of the arrangement. Follett recognized that very few situations in life allow this to be possible and that, for many companies, this approach is impossible without incurring social costs in terms of a disaffected workforce. The second solution is compromise. In a compromise, neither side gets exactly everything it wants, and the best each side can do is obtain a result that each can agree too. The problem with this approach is that both sides give up what they really want and settle on what they can agree on. In a compromise, neither side is happy. The third way to solve conflict is integration, which occurs when each party states its preferences and attempts to reach an agreement. Follett provided an example of integration:

In the Harvard Library one day, in one of the smaller rooms, someone wanted the window open. I wanted it shut. We opened the window in the next room where no one was sitting.<sup>56</sup>

It would appear that this situation is a compromise. But closely look at it; Follett wanted the window closed, and her study partner wanted a window open. It just did not have to be in that room. Because they rearranged the problem, they came up with a solution that was satisfactory to both of them.

## CONCEPT CHECK

1. What did the Hawthorne studies, Barnard, and Fayol contribute to management thought?
2. What did the works of Follett and Mayo contribute to management thought?

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# 15. Contingency and System Management

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## 7. How did contingency and systems management transform management thought?

The 1950s and 1960s saw the establishment of two schools that competed with and complemented the scientific management and human relations approaches. The first school of thought was the systems school. Some of the leaders of the systems school were Kenneth Boulding, Daniel Katz, Robert Kahn, and Ludwig von Bertalanffy. These men came from diverse disciplines (psychology, economics, sociology, and even biology) and attempted to explain how external factors determine managerial outcomes.<sup>57</sup> The major purpose behind systems school research was to understand the external conditions that organizations face and how to handle these conditions. The major overview of the systems theorists was that firms were an open system, that is, a system that interacts with its environment. In this case, the environment interacts with the firm in that it provides and accepts valued resources from the firm. For instance, the raw components of an iPhone are gathered by Apple. Through knowledge, procedures, tools, and resources, Apple takes these components and creates something of value for its customers, after which the consumer purchases the final product. In addition to providing financial resources to the firm, customers provide the firm with information—namely whether they like the product enough to purchase it.

The issue that systems management raises is that the managers' actions are the products of outside factors. For example, if you are a human resource manager, the actions you take are determined by employment law. The law requires corporations to have tests that are both consistent and reliable. When a manager violates this law, the firm can expect a lawsuit. Likewise, the laws of supply and demand determine the salary range that a firm will offer to job applicants. If the firm pays above market, they can expect their pick of the best candidates; below market, they may have a difficult time finding quality workers. From a strategic perspective, how firms compete against each other will be determined, in part, by the general external environment. For example, Apple's ability to sell iPhones is constricted by outside factors, including technology, suppliers, customers, and competitors. Every Android phone sold limits how many iPhones Apple can sell.

The other school that made a contribution to management thought during this time was the contingency school. Prior to the development of the contingency school, management scholars sought the one best way of managing. The contingency school changed this by proposing that there are no universal rules in management. External and internal factors create unique situations, and each situation requires a different response. What is the most appropriate response in one situation may not work in another. The key statement of the contingency school is "it depends." One of the major theorists in this school is Joan Woodward, a British scholar who did her work in the 1950s and 1960s.<sup>58</sup> She argued that contingencies, such as technology, play a role in how much training workers should receive. For instance, one of the major themes in management today is that workers should be well-trained. Woodward would argue that for low-tech jobs, this might not be the case but that for jobs requiring quite bit of technology, training would be a necessity.

## Modern Management

From the 1970s to the present, we have seen the various management schools of thought interwoven. One of the major approaches in modern management is the development of managerial theories. When people hear the word *theory*, they usually assume that it refers to something impractical and disconnected from real life. The reality is that theory is a prediction and an explanation. Since the 1970s, the concept of theory has entered into the management literature and has led to more rigorous research.<sup>59</sup> The body of knowledge explored in this book about concepts such as strategy, organizational behavior, human resource management, and organizational theory has many roots from the 1970s. For

example, when you get to job design, you will learn about the Hackman and Oldham model of job design, which was first proposed in 1975. Management has been enriched over the last 40 years by the contributions from researchers in allied fields such as economics, psychology, and sociology.

Based on the theoretical research of the last 40 or so years, scholars such as Stanford University's Jeffrey Pfeffer have now proposed the idea for evidence-based management.<sup>60</sup> The idea is to recommend managerial practices that have been tested. In many ways, this brings us back to Taylor and the need for science-based management. Once again, management thinkers are seeking to use formalized research to eliminate bad management techniques that have been recommended over the last several years.

**Exhibit 3.6** indicates how each of the thinkers we discussed in this chapter relates to the others. From Taylor and others, we learned about the basic outcomes of human resource management, control, and some aspects of motivation. From Fayol and Barnard, we began to develop concepts related to strategic management and authority. Mary Parker Follett provided insights into leadership. Elton Mayo and his colleagues launched the field of organizational behavior, and their work continues to have an impact on the fields of motivation, stress, and job design. Weber gave us the start of organizational design and the importance of authority.

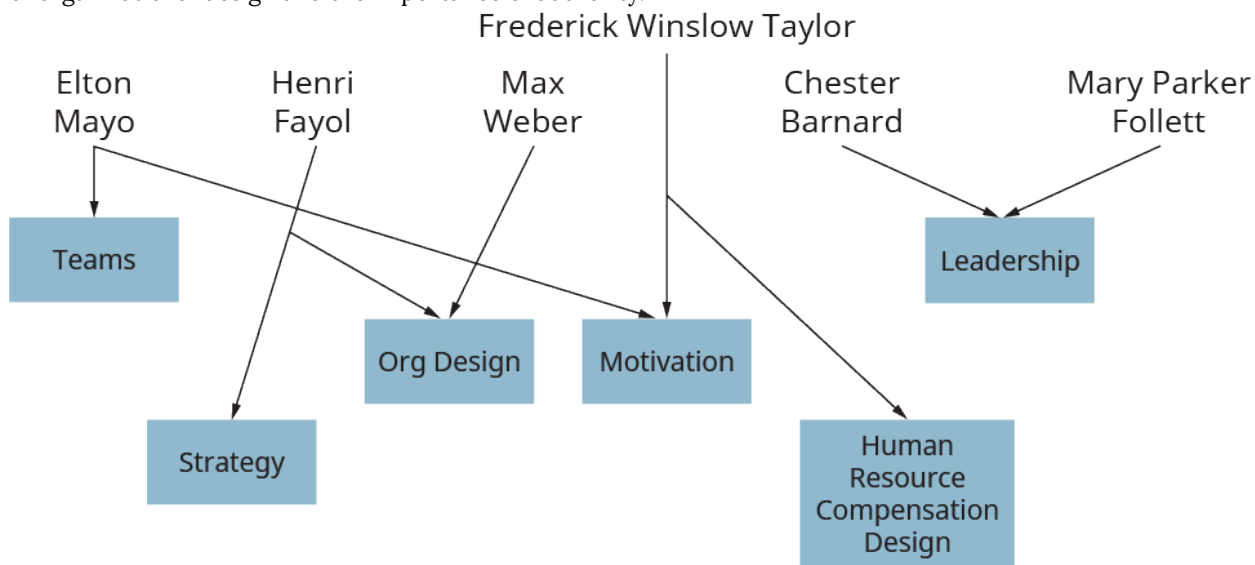


Exhibit 3.6 The Development of Management Thought (Attribution: Copyright Rice University, OpenStax, under CC-BY 4.0 license)

## CONCEPT CHECK

1. What is the going contribution of systems and contingency management thought?
2. What is the idea of evidence-based management?

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PART III

## CHAPTER 3: ACHIEVING WORLD-CLASS OPERATIONS MANAGEMENT



# 16. Introduction

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## Learning Objectives

**After reading this chapter, you should be able to answer these questions:**

1. Why is production and operations management important in both manufacturing and service firms?
2. What types of production processes do manufacturers and service firms use?
3. How do organizations decide where to put their production facilities? What choices must be made in designing the facility?
4. Why are resource-planning tasks such as inventory management and supplier relations critical to production?
5. How do operations managers schedule and control production?
6. How can quality-management and lean-manufacturing techniques help firms improve production and operations management?
7. What roles do technology and automation play in manufacturing and service-industry operations management?
8. What key trends are affecting the way companies manage production and operations?

Deborah Butler, Caterpillar

Deborah Butler is a certified Master Black Belt, but don't expect to see her working with Jet Li anytime soon. In fact, her job has little to do with martial arts. Employed by Caterpillar, "the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines, and industrial gas turbines," Butler's Master Black Belt status reflects her expertise in Six Sigma, the process Caterpillar employees use to continually manage, improve, and create processes, products, and services. "Sigma" refers to the maximum number of defects tolerated in production or service delivery;

Six Sigma is the highest level of quality control, demanding no more than 3.4 defects per million parts. That means if you were to use Six Sigma in your college career, you would miss only *one half of a single question* over four years of test-taking!

Caterpillar was the first corporation to take Six Sigma global, deploying it corporate-wide in 2001 not only to its almost 300 facilities, but also eventually to every dealer and more than 850 key suppliers throughout the world. The corporation hails the process as a key element of its overall operations management, attributing increased profits, improved customer service, and supply-chain efficiency to Six Sigma.

Caterpillar's more than 300 Master Black Belts lead projects that use Six Sigma and train the company's approximately 3,300 Black Belts in the principles of the process. Butler is currently in charge of updating and implementing *Our Values in Action: Caterpillar's Worldwide Code of Conduct*. Outlining the four core values of integrity, excellence, teamwork, and commitment, the updated code of conduct embodies two important aspects of Caterpillar's philosophy on Six Sigma.

Sigma is a Greek letter that represents a statistical unit of measurement and defines standard deviation. Caterpillar uses this standard deviation for the number of errors in a product, which equates to 3.4 errors per million. Six Sigma is designed to reduce the number of errors in a process by a step-by-step approach. Caterpillar uses the Six Sigma methodology that utilizes the process of gathering information, analyzing the data, and then making decisions based on the facts. This process ensures that Caterpillar is meeting the requirements of the customer.

Caterpillar recognizes that employees are the heart of any operation. Therefore, Caterpillar employees use Six Sigma to improve as people and as workers as much as to improve the products they produce. The core values, reflected in a series of action statements such as "We put Integrity in action when we compete fairly," are the product of a yearlong development process involving Butler's global team. As part of the project research, the team interviewed thousands of Caterpillar employees, from officers of the company to production and hourly workers, for the purpose of, as Butler says, "bringing to the surface the values that have made Caterpillar a successful enterprise, enhancing behavioral expectations, and accurately expressing Caterpillar's corporate culture."

Caterpillar is not content simply to produce *Our Values in Action* and leave it at that, however, and the second aspect of its Six Sigma philosophy is that employees must bring the process to their lives. Butler has worked to inject the code of conduct's values into employees' day-to-day work. If an employee writes about safety-related changes, for example, she would not just list the changes. Instead, she might write first: "According to Our Values In Action, we put Commitment in action when we protect the health and safety of others and ourselves. As such, we are implementing the following changes. . . ." In this way, the code becomes a living part of corporate culture, a critical component of operations management.

Sources: Heather McBroom, "6 Sigma: Foundation for Quality at Caterpillar," *Peoria Magazine*, <http://www.peoriamagazines.com>, accessed February 20, 2018; John Gillett, Ross Fink, and Nick Bevington, "How Caterpillar Uses 6 Sigma to Execute Strategy," *Strategic Finance Magazine*, <http://sfmagazine.com>, accessed February 20, 2018; company website, "Christopher Six Sigma Black Belt," <https://www.caterpillar.com>, accessed February 20, 2018.

Nearly every type of business organization needs to find the most efficient and effective methods of producing the goods or services it sells to its customers. Technological advances, ongoing competition, and consumer expectations force companies to rethink where, when, and how they will produce products or services.

Manufacturers have discovered that it is no longer enough to simply push products through the factory and onto the market. Consumers demand high quality at reasonable prices. They also expect manufacturers to deliver products in a timely manner. Firms that can't meet these expectations often face strong competition from businesses that can. To compete, many manufacturers are streamlining how they make their products—by automating their factories, developing new production processes, focusing on quality-control techniques, and improving relationships with suppliers.

Service organizations also face challenges. Their customers are demanding better service, shorter waiting periods, and more individualized attention. Like manufacturers, service companies are using new methods to deliver what their customers need and want. Banks, for example, are using technology such as online banking and mobile apps to make



their services more accessible to customers. Colleges offer online courses to accommodate the schedules of working students. Tax services file tax returns via the cloud.

This chapter examines how manufacturers and service firms manage and control the creation of products and services. We'll discuss production planning, including the choices firms must make concerning the type of production process they will use; the location where production will occur; the design of the facility; and the management of resources needed in production. Next, we'll explain routing and scheduling, two critical tasks for controlling production and operations efficiency. Then we will look at how firms can improve production and operations by employing quality management and lean-manufacturing techniques. Finally, we will review some of the trends affecting production and operations management.

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# 17. Production and Operations Management - An Overview

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Production, the creation of products and services, is an essential function in every firm. Production turns inputs, such as natural resources, raw materials, human resources, and capital, into outputs, which are products and services. This process is shown in **(Figure)**. Managing this conversion process is the role of operations management.

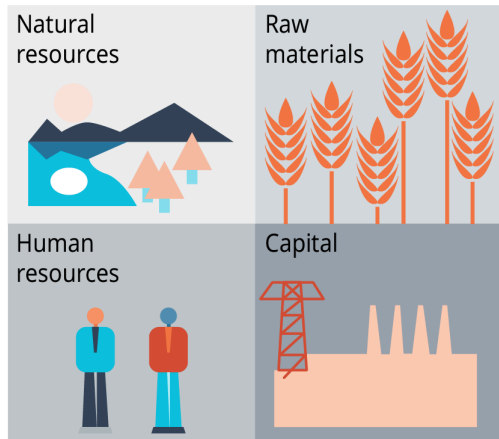


With new oil reserves now available through “fracking,” the United States is challenging Saudi Arabia and is set to become a vast supplier of oil worldwide. Unlike the smooth petroleum that gushes from Arabian wells, however, America’s black gold in the Marcellus, Bakken, and other shale regions has to be drilled horizontally through new technology. The process is rigorous: oil and gas companies drill into the ground to extract crude oil and natural gas from the shale rock that lies thousands of feet under the ground. Once the formation is reached, gallons of water, sand, and an extensive list of man-made chemicals are injected into the well under high pressure. This combination inserted in the well will fracture the rock and release crude oil and natural gas. It is estimated that the gas within these rock formations could supply the United States for generations to come as technologies evolve to drill below the earth’s surface. What are key inputs in the fracking process? (Credit: Mark Dixon/ Flickr/ Attribution 2.0 Generic (CC BY 2.0))

The goal of customer satisfaction is an important part of effective production and operations. In the past, the

manufacturing function in most companies was inwardly focused. Manufacturing had little contact with customers and didn't always understand their needs and desires. In the 1980s, many U.S. industries, such as automotive, steel, and electronics, lost customers to foreign competitors because their production systems could not provide the quality customers demanded. As a result, today most American companies, both large and small, consider a focus on quality to be a central component of effective operations management.

### Inputs (factors of production)



### Conversion Process



### Outputs



*Production Process for  
Products and Services  
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Stronger links between marketing and manufacturing also encourage production managers to be more outwardly focused and to consider decisions in light of their effect on customer satisfaction. Service companies find that making operating decisions with customer satisfaction in mind can be a competitive advantage.

Operations managers, the people charged with managing and supervising the conversion process, play a vital role in today's firm. They control about three-fourths of a firm's assets, including inventories, wages, and benefits. They also work closely with other major divisions of the firm, such as marketing, finance, accounting, and human resources, to ensure that the firm produces its goods profitably and satisfies its customers. Marketing personnel help them decide which products to make or which services to offer. Accounting and human resources help them face the challenge of combining people and resources to produce high-quality goods on time and at reasonable cost. They are involved in the development and design of goods and determine what production processes will be most effective.

Production and operations management involve three main types of decisions, typically made at three different stages:

1. *Production planning.* The first decisions facing operations managers come at the *planning stage*. At this stage, managers decide where, when, and how production will occur. They determine site locations and obtain the necessary resources.
2. *Production control.* At this stage, the decision-making process focuses on controlling quality and costs, scheduling, and the actual day-to-day operations of running a factory or service facility.
3. *Improving production and operations.* The final stage of operations management focuses on developing more efficient methods of producing the firm's goods or services.

All three decisions are ongoing and may occur simultaneously. In the following sections, we will take a closer look at the decisions and considerations firms face in each stage of production and operations management.

## Gearing Up: Production Planning

An important part of operations management is production planning. Production planning allows the firm to consider the competitive environment and its own strategic goals to find the best production methods. Good production planning has to balance goals that may conflict, such as providing high-quality service while keeping operating costs low, or keeping profits high while maintaining adequate inventories of finished products. Sometimes accomplishing all these goals is difficult.

From its storied creation in post-war Italy to its big-screen immortalization in movies such as *Roman Holiday* and *Quadrophenia*, the Vespa scooter has a reputation for romance, rebellion, and style. Manufactured by Italy's Piaggio Group, the Vespa's svelte, stainless-steel chassis and aeronautic-inspired designs are seen everywhere in Europe and more and more in the United States. The Piaggio Group presently operates factories in Italy, Vietnam, India, and China. *What important production-planning decisions does Piaggio need to make as it considers expanding into more overseas markets?* (Credit: Steve Watkins/ Flickr/ Attribution-2.0 Generic (CC BY2.0))

A photograph shows customized Vespa scooters parked on a grassy field with tents in the background.

Production planning involves three phases. Long-term planning has a time frame of three to five years. It focuses on which goods to produce, how many to produce, and where they should be produced. Medium-term planning decisions cover about two years. They concern the layout of factory or service facilities, where and how to obtain the resources needed for production, and labor issues. Short-term planning, within a one-year time frame, converts these broader goals into specific production plans and materials management strategies.

Four important decisions must be made in production planning. They involve the type of production process that will be used, site selection, facility layout, and resource planning.

1. What are the three types of decisions that must be made in production planning?
2. What are the three phases of production planning?

## Summary of Learning Outcomes

1. Why is production and operations management important in both manufacturing and service firms?

In the 1980s, many U.S. manufacturers lost customers to foreign competitors because their production and operations management systems did not support the high-quality, reasonably priced products consumers demanded. Service organizations also rely on effective operations management in order to satisfy consumers. Operations managers, the personnel charged with managing and supervising the conversion of inputs into outputs, work closely with other functions in organizations to help ensure quality, customer satisfaction, and financial success.

## Glossary

**operations management**

Management of the production process.

**production**

The creation of products and services by turning inputs, such as natural resources, raw materials, human resources, and capital, into outputs, which are products and services.

**production planning**

The aspect of operations management in which the firm considers the competitive environment and its own strategic goals in an effort to find the best production methods.

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# 18. The Production Process: How Do We Make It?

OPENSTAX

## 2. What types of production processes do manufacturers and service firms use?

In production planning, the first decision involves which type of production process—the way a good or service is created—best fits with company goals and customer demand. An important consideration is the type of good or service being produced, because different goods may require different production processes. In general, there are three types of production: mass production, mass customization, and customization. In addition to production type, operations managers also classify production processes in two ways: (1) how inputs are converted into outputs and (2) the timing of the process.

### One for All: Mass Production

Mass production, manufacturing many identical goods at once, was a product of the Industrial Revolution. Henry Ford's Model-T automobile is a good example of early mass production. Each car turned out by Ford's factory was identical, right down to its color. If you wanted a car in any color except black, you were out of luck. Canned goods, over-the-counter drugs, and household appliances are other examples of goods that are mass-produced. The emphasis in mass production is on keeping manufacturing costs low by producing uniform products using repetitive and standardized processes. As products became more complicated to produce, mass production also became more complex. Automobile manufacturers, for example, must now incorporate more sophisticated electronics into their car designs. As a result, the number of assembly stations in most automobile manufacturing plants has increased.

### Just for You: Customizing Goods

In mass customization, goods are produced using mass-production techniques, but only up to a point. At that point, the product or service is custom-tailored to the needs or desires of individual customers. For example, American Leather, a Dallas-based furniture manufacturer, uses mass customization to produce couches and chairs to customer specifications within 30 days. The basic frames in the furniture are the same, but automated cutting machinery precuts the color and type of leather ordered by each customer. Using mass-production techniques, they are then added to each frame.

Customization is the opposite of mass production. In customization, the firm produces goods or services one at a time according to the specific needs or wants of individual customers. Unlike mass customization, each product or service produced is unique. For example, a print shop may handle a variety of projects, including newsletters, brochures, stationery, and reports. Each print job varies in quantity, type of printing process, binding, color of ink, and type of paper. A manufacturing firm that produces goods in response to customer orders is called a job shop.



Classification of  
Production Types  
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Mass Production	Mass Customization	Customization
Highly uniform products or services  Many products made sequentially	Uniform standardized production to a point, then unique features added to each product	Each product or service produced according to individual customer requirements
<b>Examples:</b> Breakfast cereals, soft drinks, and computer keyboards	<b>Examples:</b> Dell Computers, tract homes, and Taylor Made golf clubs	<b>Examples:</b> Custom homes, legal services, and haircuts

Some types of service businesses also deliver customized services. Doctors, for instance, must consider the illnesses and circumstances of each individual patient before developing a customized treatment plan. Real estate agents may develop a customized service plan for each customer based on the type of house the person is selling or wants to buy. The differences between mass production, mass customization, and customization are summarized in **(Figure)**.

## Converting Inputs to Outputs

As previously stated, production involves converting *inputs* (natural resources, raw materials, human resources, capital) into *outputs* (products or services). In a manufacturing company, the inputs, the production process, and the final outputs are usually obvious. Harley-Davidson, for instance, converts steel, rubber, paint, and other inputs into motorcycles. But the production process in a service company involves a less obvious conversion. For example, a hospital converts the knowledge and skills of its medical personnel, along with equipment and supplies from a variety of sources, into health care services for patients. **(Figure)** provides examples of the inputs and outputs used by various other businesses.

There are two basic processes for converting inputs into outputs. In process manufacturing, the basic inputs (natural resources, raw materials) are broken down into one or more outputs (products). For instance, bauxite (the input) is processed to extract aluminum (the output). The assembly process is just the opposite. The basic inputs, like natural resources, raw materials, or human resources, are either *combined* to create the output or *transformed* into the output. An airplane, for example, is created by assembling thousands of parts, which are its raw material inputs. Steel manufacturers use heat to transform iron and other materials into steel. In services, customers may play a role in the transformation process. For example, a tax preparation service combines the knowledge of the tax preparer with the client's information about personal finances in order to complete the tax return.

## Production Timing

A second consideration in choosing a production process is timing. A continuous process uses long production runs that may last days, weeks, or months without equipment shutdowns. This is best for high-volume, low-variety products

with standardized parts, such as nails, glass, and paper. Some services also use a continuous process. Your local electric company is an example. Per-unit costs are low, and production is easy to schedule.

Converting Inputs to Outputs		
Type of Organization	Input	Output
Airline	Pilots, flight attendants, reservations system, ticketing agents, customers, airplanes, maintenance crews, ground facilities	Movement of customers and freight
Grocery store	Merchandise, building, clerks, supervisors, store fixtures, shopping carts, customers	Groceries for customers
High school	Faculty, curriculum, buildings, classrooms, library, auditorium, gymnasium, students, staff, supplies	Graduates, public service
Manufacturer	Machinery, raw materials, plant, workers, managers	Finished products for consumers and other firms
Restaurant	Food, cooking equipment, servers, chefs, dishwashers, host, patrons, furniture, fixtures	Meals for patrons

In an intermittent process, short production runs are used to make batches of different products. Machines are shut down to change them to make different products at different times. This process is best for low-volume, high-variety products such as those produced by mass customization or customization. Job shops are examples of firms using an intermittent process.

Although some service companies use continuous processes, most service firms rely on intermittent processes. For instance, a restaurant preparing gourmet meals, a physician performing surgical procedures, and an advertising agency developing ad campaigns for business clients all customize their services to suit each customer. They use the intermittent process. Note that their “production runs” may be very short—one grilled salmon or one physical exam at a time.

1. Describe the different types of production processes.
2. How are inputs transformed into outputs in a variety of industries?

## Summary of Learning Outcomes

2. What types of production processes do manufacturers and service firms use?

Products are made using one of three types of production processes. In mass production, many identical goods are produced at once, keeping production costs low. Mass production, therefore, relies heavily on standardization, mechanization, and specialization. When mass customization is used, goods are produced using mass-production techniques up to a point, after which the product or service is custom-tailored to individual customers by adding special features. When a firm’s production process is built around customization, the firm makes many products one at a time according to the very specific needs or wants of individual customers.



## Glossary

**assembly process**

A production process in which the basic inputs are either combined to create the output or transformed into the output.

**continuous process**

A production process that uses long production runs lasting days, weeks, or months without equipment shutdowns; generally used for high-volume, low-variety products with standardized parts.

**customization**

The production of goods or services one at a time according to the specific needs or wants of individual customers.

**intermittent process**

A production process that uses short production runs to make batches of different products; generally used for low-volume, high-variety products.

**job shop**

A manufacturing firm that produces goods in response to customer orders.

**mass customization**

A manufacturing process in which goods are mass-produced up to a point and then custom-tailored to the needs or desires of individual customers.

**mass production**

The manufacture of many identical goods at once.

**process manufacturing**

A production process in which the basic input is broken down into one or more outputs (products).

**production process**

The way a good or service is created.

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# 19. Location, Location, Location: Where Do We Make It?

OPENSTAX

3. How do organizations decide where to put their production facilities? What choices must be made in designing the facility?

A big decision that managers must make early in production and operations planning is where to put the facility, be it a factory or a service office. The facility's location affects operating and shipping costs and, ultimately, the price of the product or service and the company's ability to compete. Mistakes made at this stage can be expensive, because moving a factory or service facility once production begins is difficult and costly. Firms must weigh a number of factors to make the right decision.

## Availability of Production Inputs

As we discussed earlier, organizations need certain resources to produce products and services for sale. Access to these resources, or inputs, is a huge consideration in site selection. Executives must assess the availability of raw materials, parts, equipment, and available manpower for each site under consideration. The cost of shipping raw materials and finished goods can be as much as 25 percent of a manufacturer's total cost, so locating a factory where these and other costs are as low as possible can make a major contribution to a firm's success.

Companies that use heavy or bulky raw materials, for example, may choose to be located close to their suppliers. Mining companies want to be near ore deposits, oil refiners near oil fields, paper mills near forests, and food processors near farms. Bottlers are discovering that rural western communities in need of an economic boost make rich water sources. In Los Lunas, New Mexico, it made sense for Niagara Purified Drinking Water to produce purified bottled water in a 166,000 square foot building that was vacant. The business helps diversify the town's economy and created 40 new, much-needed jobs.

Soyoung Kim, "New Water Bottling Plant in Los Lunas Brings Jobs, But Also Concerns," KRQE News, <http://krqe.com>, November 17, 2016.

The availability and cost of labor are also critical to both manufacturing and service businesses, and the unionization of local labor is another point to consider in many industries. Payroll costs can vary widely from one location to another due to differences in the cost of living; the number of jobs available; and the size, skills, and productivity of the local workforce. In the case of the water-bottling company, a ready pool of relatively inexpensive labor was available due to high unemployment in the areas.

## Marketing Factors

Businesses must evaluate how their facility location will affect their ability to serve their customers. For some firms it may not be necessary to be located near customers. Instead, the firm will need to assess the difficulty and costs of distributing its goods to customers from its chosen location. Other firms may find that locating near customers can

provide marketing advantages. When a factory or service center is close to customers, the firm can often offer better service at a lower cost. Other firms may gain a competitive advantage by locating their facilities so that customers can easily buy their products or services. The location of competitors may also be a consideration. And businesses with more than one facility may need to consider how far to spread their locations in order to maximize market coverage.

## Manufacturing Environment

Another factor to consider is the manufacturing environment in a potential location. Some localities have a strong existing manufacturing base. When a large number of manufacturers in a certain industry are already located in an area, that area is likely to offer greater availability of resources, such as manufacturing workers, better accessibility to suppliers and transportation, and other factors that can increase a plant's operating efficiency.

Nestlé is proposing to open a new bottled water plant in the desert city of Phoenix. The plants have provided much-needed employment to replace jobs lost in the recession of 2008. The city of Phoenix faced opposition to the plant because some locals thought that diverting water from tap water to a for-profit entity was not a sound idea. Phoenix officials contend that the source of water is adequate for decades to come.

Brandon Loomis, "What drought? Nestle Plans \$35 million plant to bottle water in Phoenix," *The Republic*, <https://www.azcentral.com>, May 19, 2016.

## Local Incentives

Incentives offered by countries, states, or cities may also influence site selection. Tax breaks are a common incentive. A locality may reduce the amount of taxes a firm must pay on income, real estate, utilities, or payroll. Local governments may offer financial assistance and/or exemptions from certain regulations to attract or keep production facilities in their area. For example, many U.S. cities are competing to attract a second Amazon headquarters and, in addition to touting local attractions and a strong workforce, most of them are offering a host of tax incentives.

Lydia DePillis, "Cities Try to Lure Amazon, But Want to Keep the Details Secret," CNN, <http://money.cnn.com>, October 19, 2017.

## International Location Considerations

There are often sound financial reasons for considering a foreign location. Labor costs are considerably lower in countries such as Singapore, China, India, and Mexico. Foreign countries may also have fewer regulations governing how factories operate. A foreign location may also move production closer to new markets. Automobile manufacturers such as Toyota, BMW, and Hyundai are among many that build plants in the United States to reduce shipping costs.

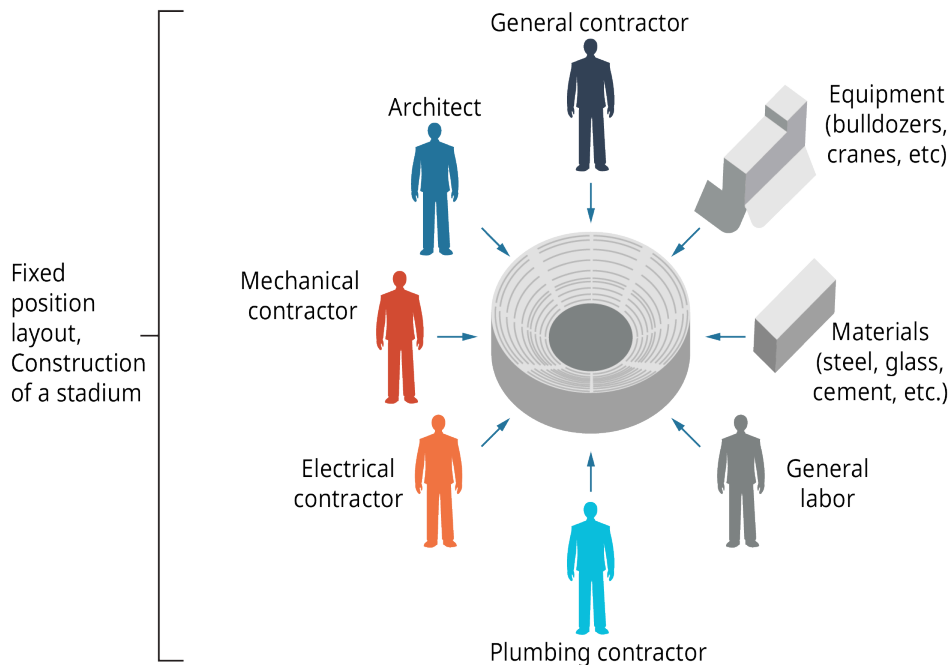
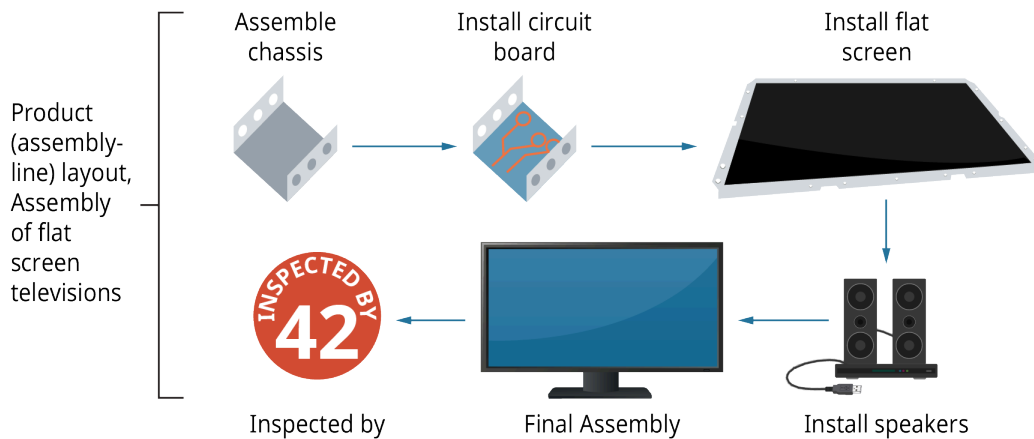
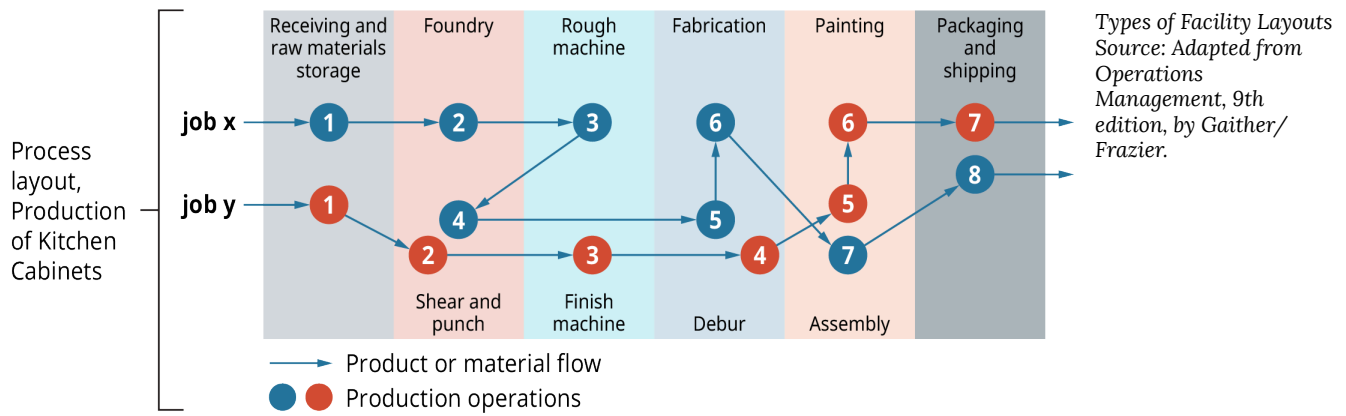
## Designing the Facility

After the site location decision has been made, the next focus in production planning is the facility's layout. The goal is to determine the most efficient and effective design for the particular production process. A manufacturer might opt

for a U-shaped production line, for example, rather than a long, straight one, to allow products and workers to move more quickly from one area to another.

Service organizations must also consider layout, but they are more concerned with how it affects customer behavior. It may be more convenient for a hospital to place its freight elevators in the center of the building, for example, but doing so may block the flow of patients, visitors, and medical personnel between floors and departments.

There are three main types of facility layouts: process, product, and fixed-position. All three layouts are illustrated in **(Figure)**. Cellular manufacturing is another type of facility layout.



## Process Layout: All Welders Stand Here

The process layout arranges workflow around the production process. All workers performing similar tasks are grouped together. Products pass from one workstation to another (but not necessarily to every workstation). For example, all grinding would be done in one area, all assembling in another, and all inspection in yet another. The process layout is best for firms that produce small numbers of a wide variety of products, typically using general-purpose machines that can be changed rapidly to new operations for different product designs. For example, a manufacturer of custom machinery would use a process layout.

## Product Layout: Moving Down the Line

Products that require a continuous or repetitive production process use the product (or assembly-line) layout. When large quantities of a product must be processed on an ongoing basis, the workstations or departments are arranged in a line with products moving along the line. Automobile and appliance manufacturers, as well as food-processing plants, usually use a product layout. Service companies may also use a product layout for routine processing operations.

## Fixed-Position Layout: Staying Put

Some products cannot be put on an assembly line or moved about in a plant. A fixed-position layout lets the product stay in one place while workers and machinery move to it as needed. Products that are impossible to move—ships, airplanes, and construction projects—are typically produced using a fixed-position layout. Limited space at the project site often means that parts of the product must be assembled at other sites, transported to the fixed site, and then assembled. The fixed-position layout is also common for on-site services such as housecleaning services, pest control, and landscaping.

## Cellular Manufacturing: A Start-to-Finish Focus

Cellular manufacturing combines some aspects of both product and fixed-position layouts. Work cells are small, self-contained production units that include several machines and workers arranged in a compact, sequential order. Each work cell performs all or most of the tasks necessary to complete a manufacturing order. There are usually five to 10 workers in a cell, and they are trained to be able to do any of the steps in the production process. The goal is to create a team environment wherein team members are involved in production from beginning to end.

1. What factors does a firm consider when making a site-selection decision?
2. What should be considered when deciding on a production approach?

## Summary of Learning Outcomes

3. How do organizations decide where to put their production facilities? What choices must be made in designing the facility?

Site selection affects operating costs, the price of the product or service, and the company's ability to compete. In choosing a production site, firms must weigh the availability of resources—raw materials, manpower, and even capital—needed for production, as well as the ability to serve customers and take advantage of marketing opportunities. Other factors include the availability of local incentives and the manufacturing environment. Once a site is selected, the firm must choose an appropriate design for the facility. The three main production facility designs are process, product, and fixed-position layouts. Cellular manufacturing is another type of facility layout.

## Glossary

### **cellular manufacturing**

Production technique that uses small, self-contained production units, each performing all or most of the tasks necessary to complete a manufacturing order.

### **fixed-position layout**

A facility arrangement in which the product stays in one place and workers and machinery move to it as needed.

### **process layout**

A facility arrangement in which work flows according to the production process. All workers performing similar tasks are grouped together, and products pass from one workstation to another.

### **product (or assembly-line) layout**

A facility arrangement in which workstations or departments are arranged in a line with products moving along the line.

Download for free at <http://cnx.org/contents/c3acb2ab-7d5c-45ad-b3cd-e59673fedd4e@8.80>



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## 20. Pulling It Together: Resource Planning

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### 4. Why are resource-planning tasks such as inventory management and supplier relations critical to production?

As part of the production-planning process, firms must ensure that the resources needed for production—such as raw materials, parts, equipment, and labor—will be available at strategic moments in the production process. This can be a huge challenge. The components used to build just one Boeing airplane, for instance, number in the millions. Cost is also an important factor. In many industries, the cost of materials and supplies used in the production process amounts to as much as half of sales revenues. Resource planning is therefore a big part of any firm's production strategy.

Resource planning begins by specifying which raw materials, parts, and components will be required, and when, to produce finished goods. To determine the amount of each item needed, the expected quantity of finished goods must be forecast. A bill of materials is then drawn up that lists the items and the number of each required to make the product. Purchasing, or *procurement*, is the process of buying production inputs from various sources.

### Make or Buy?

The firm must decide whether to make its own production materials or buy them from outside sources. This is the make-or-buy decision. The quantity of items needed is one consideration. If a part is used in only one of many products, buying the part may be more cost-effective than making it. Buying standard items, such as screws, bolts, rivets, and nails, is usually cheaper and easier than producing them internally. Purchasing larger components from another manufacturer can be cost-effective as well. When items are purchased from an outside source instead of being made internally, it is called outsourcing. Harley-Davidson, for example, purchases its tires, brake systems, and other motorcycle components from manufacturers that make them to Harley's specifications. However, if a product has special design features that need to be kept secret to protect a competitive advantage, a firm may decide to produce all parts internally.

In deciding whether to make or buy, a firm must also consider whether outside sources can provide the high-quality supplies it needs in a reliable manner. Having to shut down production because vital parts aren't delivered on time can be a costly disaster. Just as bad are inferior parts or materials, which can damage a firm's reputation for producing high-quality goods. Therefore, firms that buy some or all of their production materials from outside sources should make building strong relationships with quality suppliers a priority.

### Inventory Management: Not Just Parts

A firm's inventory is the supply of goods it holds for use in production or for sale to customers. Deciding how much inventory to keep on hand is one of the biggest challenges facing operations managers. On the one hand, with large inventories, the firm can meet most production and customer demands. Buying in large quantities can also allow a company to take advantage of quantity discounts. On the other hand, large inventories can tie up the firm's money, are expensive to store, and can become obsolete.

Inventory management involves deciding how much of each type of inventory to keep on hand and the ordering, receiving, storing, and tracking of it. The goal of inventory management is to keep down the costs of ordering and holding inventories while maintaining enough on hand for production and sales. Good inventory management enhances



product quality, makes operations more efficient, and increases profits. Poor inventory management can result in dissatisfied customers, financial difficulties, and even bankruptcy.

One way to determine the best inventory levels is to look at three costs: holding inventory, frequent reordering, and not keeping enough inventory on hand. Managers must measure all three costs and try to minimize them.

To control inventory levels, managers often track the use of certain inventory items. Most companies keep a perpetual inventory, a continuously updated list of inventory levels, orders, sales, and receipts, for all major items. Today, companies mostly use computers to track inventory levels, calculate order quantities, and issue purchase orders at the right times.

## Computerized Resource Planning

Many manufacturing companies have adopted computerized systems to control the flow of resources and inventory. Materials requirement planning (MRP) is one such system. MRP uses a master schedule to ensure that the materials, labor, and equipment needed for production are at the right places in the right amounts at the right times. The schedule is based on forecasts of demand for the company's products. It says exactly what will be manufactured during the next few weeks or months and when the work will take place. Sophisticated computer programs coordinate all the elements of MRP. The computer comes up with materials requirements by comparing production needs to the materials the company already has on hand. Orders are placed so items will be on hand when they are needed for production. MRP helps ensure a smooth flow of finished products.

Manufacturing resource planning II (MRPII) was developed in the late 1980s to expand on MRP. It uses a complex computerized system to integrate data from many departments, including finance, marketing, accounting, engineering, and manufacturing. MRPII can generate a production plan for the firm, as well as management reports, forecasts, and financial statements. The system lets managers make more accurate forecasts and assess the impact of production plans on profitability. If one department's plans change, the effects of these changes on other departments are transmitted throughout the company.

Whereas MRP and MRPII systems are focused internally, enterprise resource planning (ERP) systems go a step further and incorporate information about the firm's suppliers and customers into the flow of data. ERP unites all of a firm's major departments into a single software program. For instance, production can call up sales information and know immediately how many units must be produced to meet customer orders. By providing information about the availability of resources, including both the human resources and materials needed for production, the system allows for better cost control and eliminates production delays. The system automatically notes any changes, such as the closure of a plant for maintenance and repairs on a certain date or a supplier's inability to meet a delivery date, so that all functions adjust accordingly. Both large and small organizations use ERP to improve operations.

## Keeping the Goods Flowing: Supply-Chain Management

In the past, the relationship between purchasers and suppliers was often competitive and antagonistic. Businesses used many suppliers and switched among them frequently. During contract negotiations, each side would try to get better terms at the expense of the other. Communication between purchasers and suppliers was often limited to purchase orders and billing statements.

Today, however, many firms are moving toward a new concept in supplier relationships. The emphasis is increasingly on developing a strong supply chain. The supply chain can be thought of as the entire sequence of securing inputs, producing goods, and delivering goods to customers. If any links in this process are weak, chances are customers—the end point of the supply chain—will end up dissatisfied.

Effective supply-chain strategies reduce costs. For example, integration of the shipper and customer's supply chains allows companies to automate more processes and save time. Technology also improves supply-chain efficiency by tracking goods through the various supply-chain stages and helping with logistics. With better information about production and inventory, companies can order and receive goods at the optimal point to keep inventory holding costs low.

Companies also need contingency plans for supply-chain disruptions. Is there an alternative source of supply if a blizzard closes the airport so that cargo planes can't land or a drought causes crop failures in the Midwest? By thinking ahead, companies can avert major losses. The length and distance involved in a supply line is also a consideration. Importing parts from or outsourcing manufacturing to Asia creates a long supply chain for a manufacturer in Europe or the United States. Perhaps there are closer suppliers or manufacturers who can meet a company's needs at a lower overall cost. Companies should also reevaluate outsourcing decisions periodically.

## Strategies for Supply-Chain Management

Ensuring a strong supply chain requires that firms implement supply-chain management strategies. Supply-chain management focuses on smoothing transitions along the supply chain, with the ultimate goal of satisfying customers with quality products and services. A critical element of effective supply-chain management is to develop tight bonds with suppliers. This may mean reducing the number of suppliers used and asking them to offer more services or better prices in return for an ongoing relationship.

Managing an efficient supply chain is critical for businesses, especially when the product being delivered is a bouquet of fresh-cut flowers. To ensure that only the freshest, most colorful floral arrangement arrives for that special someone, online floral delivery acts as a national website that serves customers through reputable local florists that deliver the same day. The site uses a web service that draws in customers through search, combined with coordinated carrier scheduling and a review of local florist quality that allows delivery of flowers fresher than the competition.

*What strategies help businesses create and maintain an effective supply chain?* (Credit: Brood\_wich/ Flickr/  
Attribution-2.0 Generic (CC BY 2.0))

A photograph shows a local florist's workshop with a freshly prepared bouquet of flowers

General Motors plans to pare the number of its suppliers to give larger, longer-term contracts to a strategically selected group to be based in a new supplier park near its Texas-based SUV plant. GM is one of several manufacturing firms reconsidering far-flung suppliers in their supply chain. Global parts networks have long been seen as critical to cutting costs, but more companies are concluding they're a risky bet due to political shifts, protectionist measures, and natural disasters. The automaker says its new move was planned before President Donald Trump criticized GM's Mexican imports, and the new supplier park will trim logistics expenses and bring other gains from proximity of parts to the assembly plant.

Mike Colias and William Mauldin, "GM Expects to Move 600 Supplier Jobs from Mexico to Texas," *The Wall Street Journal*, <https://www.wsj.com>, June 16, 2017.

Instead of being viewed as "outsiders" in the production process, many suppliers play an important role in supporting the operations of their customers. They are expected to meet high quality standards, offer suggestions that can help reduce production costs, and even contribute to the design of new products.

Sophisticated Supply-Chain Strategies Keep Products on the Move

Headquartered in Tokyo but with offices around the world, shipping company MOL (Mitsui O.S.K. Lines, Ltd.) is taking integrating with its customers to new levels. It is joining its customers in a series of joint ventures to build and operate

dedicated vessels for as long as 25 years. One such joint venture teamed MOL with a Chinese steel mill to build and sail ships bringing Brazilian iron ore and coal across the Pacific Ocean for processing.

Sophisticated supply-chain systems that control every aspect of production and transportation are the key to making offshore manufacturing work. Supply-chain software that monitors operations and continually makes adjustments ensures that all processes are running at peak efficiency. By tightly mapping an entire sequence—from order to final delivery—and by automating it as much as possible, supply-chain management can deliver products from across the world while at the same time cutting costs. Companies that can carry a small inventory and get paid faster improve their cash flow and profitability.

Acer, a \$7 billion Taiwanese computer and electronics maker, brings components from around the world and assembles them into everything from PC notebooks to TVs at factories in Taiwan and mainland China. It then reverses the flow by shipping these products to international buyers. “Acer sold four million portable systems. Without a solid supply-chain infrastructure behind us we couldn’t hope to do it,” says Sumit Agnihotry, Acer’s American director of notebook product marketing.

The synchronizing of trade is essential. If goods don’t get into the stores in time, sales might be lost or the company might have to carry larger inventories to avoid sellouts, which would cut into its profits. Companies need to continually monitor demand and react quickly by adjusting production. “This gets increasingly difficult when the supply chain stretches across thousands of miles and a dozen time zones,” says David Bovet, managing director of Mercer Management Consulting, a Boston-based firm that advises on business tactics. “There are strategies that smart companies are using to bring costs down to earth. Getting the most of lower labor costs overseas requires an emphasis on transportation, and supply-chain skills are a required core competency,” he says. His advice to global manufacturers: cooperate with shippers, and integrate supply chains into one cohesive system.

An important aspect of a solid supply chain is the availability of inventory, as the needs of the customer cannot be met without an in-stock supply of products. Inventory can refer to components such as the goods and materials on hand. In international global supply, some things to consider are the availability of labor, geography, and local regulations.

There needs to be a well-developed strategy in order to have a successful supply chain. Strategies include knowing your customers and their needs and planning what you want to achieve and how you are going to make it happen.

The acknowledged master of supply-chain dynamics is Dell, with its global logistics control room lined with big screens that monitor its shipping lanes at all times. Alongside Dell executives are representatives of its logistics suppliers for guidance and quick action if anything goes wrong.

Risk is the name of the game when it comes to international trade, and companies need to decide whether to play it safe with extra inventory or scramble if a disaster like a port strike occurs. Either way, they need to have contingency plans and be ready to react, and solid supply-chain strategies will ensure they are prepared for any eventuality.

Sources: “About MOL,” <http://www.mol.co.jp>, accessed February 20, 2018; “Supply Chain,” <http://www.dell.com>, accessed February 20, 2018; “Our Supply Chain,” <https://www.acer-group.com>, accessed February 20, 2018; Muddassir Ahmed, “How to Create a Supply Chain Strategic Plan That Will Work for (Nearly) Any Business,” <http://muddassirism.com>, December 4, 2016; Pamela Hyatt, “The 5 Essential Stages in Developing a Successful Supply Chain,” *Trade Ready*, <http://www.tradeready.ca>, February 12, 2016; Crystal Gilliam, “7 Tips for Effective Inventory Management in a Global Supply Chain,” *Trade Gecko*, <https://www.tradegecko.com>, October 19, 2015.

#### Critical Thinking Questions

1. Why are solid supply-chain strategies so important?
2. What problems is a company likely to experience without such strategies in place?

## E-Procurement, Electronic Data Interchange, and Blockchain

Effective supply chain management depends on strong communications with suppliers. Technology, particularly the

internet, is providing new ways to do this. E-procurement, the process of purchasing supplies and materials online, is booming. Many manufacturing firms use the internet to keep key suppliers informed about their requirements. Intel, for example, has set up a special website for its suppliers and potential suppliers. Would-be suppliers can visit the site to get information about doing business with Intel; once they are approved, they can access a secure area to make bids on Intel's current and future resource needs.

The internet also streamlines purchasing by providing firms with quick access to a huge database of information about the products and services of hundreds of potential suppliers. Many large companies now participate in *reverse auction* online, which can slash procurement costs. In a reverse auction, the manufacturer posts its specifications for the materials it requires. Potential suppliers then bid against each other to get the job. However, there are risks with reverse auctions. It can be difficult to establish and build ongoing relationships with specific suppliers using reverse auctions because the job ultimately goes to the lowest bidder. Therefore, reverse auctions may not be an effective procurement process for critical production materials. Other types of corporations can use these auctions as well. The U.S. Army utilizes reverse auctions to leverage technology to fight the reality and perception that it is inefficient in its procurement practices. The General Services Administration found that government agencies had 31 suppliers that were charging between \$9.76 and \$48.77 for the same hammer.

Christian Davenport, "Is \$48 Too Much for the Federal Government to Pay for a Hammer?" *The Washington Post*, <https://www.washingtonpost.com>, June 25, 2014.

In 2005 the U.S. Army began to partner with FedBid, Inc., the largest commercial marketplace for reverse auctions, for a variety of products, from paper to computers to helicopters. Costs dropped by \$388 million according to independent government cost estimates over the past decade.

"Army Awards FedBid Contract to Provide Reverse Auction Acquisition Solution," *Business Wire*, <https://www.businesswire.com>, May 31, 2017.

Another communications tool is electronic data interchange (EDI), in which two trading partners exchange information electronically. EDI can be conducted via a linked computer system or over the internet. The advantages of exchanging information with suppliers electronically include speed, accuracy, and lowered communication costs. EDI plays a critical role in Ford Motor Company's efforts to produce and distribute vehicles worldwide. With the emergence of blockchain technology, there is the potential to automate these types of processes to cover multiple transactions with a variety of participating organizations.

Aaron Huff, "Will Blockchain Extend or Disrupt Your Business?" *Commercial Carrier Journal*, <https://www.ccjdigital.com>, December 19, 2017.

1. What are the approaches to inventory that businesses can consider?
2. How is technology being used in resource planning?

## Summary of Learning Outcomes

4. Why are resource-planning tasks such as inventory management and supplier relations critical to production?

Production converts input resources, such as raw materials and labor, into outputs, finished products and services. Firms must ensure that the resources needed for production will be available at strategic moments in the production process. If they are not, productivity, customer satisfaction, and quality may suffer. Carefully managing inventory can help cut production costs while maintaining enough supply for production and sales. Through good relationships with suppliers, firms can get better prices, reliable resources, and support services that can improve production efficiency.

## Glossary

**bill of material**

A list of the items and the number of each required to make a given product.

**blockchain technology**

Refers to a decentralized “public ledger” of all transactions that have ever been executed. It is constantly expanding, as “completed” blocks are added to the ledger with each new transaction.

**electronic data interchange (EDI)**

The electronic exchange of information between two trading partners.

**e-procurement**

The process of purchasing supplies and materials online using the internet.

**enterprise resource planning (ERP)**

A computerized resource-planning system that incorporates information about the firm’s suppliers and customers with its internally generated data.

**inventory**

The supply of goods that a firm holds for use in production or for sale to customers.

**inventory management**

The determination of how much of each type of inventory a firm will keep on hand and the ordering, receiving, storing, and tracking of inventory.

**make-or-buy decision**

The determination by a firm of whether to make its own production materials or to buy them from outside sources.

**manufacturing resource planning II (MRPII)**

A complex computerized system that integrates data from many departments to allow managers to more accurately forecast and assess the impact of production plans on profitability.

**materials requirement planning (MRP)**

A computerized system of controlling the flow of resources and inventory. A master schedule is used to ensure that the materials, labor, and equipment needed for production are at the right places in the right amounts at the right times.

**outsourcing**

The purchase of items from an outside source rather than making them internally.

**perpetual inventory**

A continuously updated list of inventory levels, orders, sales, and receipts.

**purchasing**

The process of buying production inputs from various sources; also called *procurement*.

**supply chain**

The entire sequence of securing inputs, producing goods, and delivering goods to customers.

**supply-chain management**

The process of smoothing transitions along the supply chain so that the firm can satisfy its customers with quality products and services; focuses on developing tight bonds with suppliers.

Download for free at <http://cnx.org/contents/c3acb2ab-7d5c-45ad-b3cd-e59673fedd4e@8.80>



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## 21. Production and Operations Control

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### 5. How do operations managers schedule and control production?

Every company needs to have systems in place to see that production and operations are carried out as planned and to correct errors when they are not. The coordination of materials, equipment, and human resources to achieve production and operating efficiencies is called *production control*. Two of its key aspects are routing and scheduling.

### Routing: Where to Next?

Routing is the first step in production control. It sets out a work flow, the sequence of machines and operations through which a product or service progresses from start to finish. Routing depends on the type of goods being produced and the facility layout. Good routing procedures increase productivity and cut unnecessary costs.

One useful tool for routing is value-stream mapping, whereby production managers “map” the flow from suppliers through the factory to customers. Simple icons represent the materials and information needed at various points in the flow. Value-stream mapping can help identify where bottlenecks may occur in the production process and is a valuable tool for visualizing how to improve production routing.

Awning manufacturer Rader Awning & Upholstery used value-stream mapping to automate some of its operations. With the assistance of New Mexico Manufacturing Extension Partnership (MEP), the company evaluated how orders were processed from sales to manufacturing over two days. With the implementation of the processes suggested by MEP, productivity improved by 20 percent per salesperson, production defects decreased by 15 percent, and installation corrections dropped by 25 percent.

Claudia Infante, “Value Stream Mapping Boosts Productivity for Awning Maker,” *Finance New Mexico*, <https://financenewmexico.org>, October 9, 2016.

### Scheduling: When Do We Do It?

Closely related to routing is scheduling. Scheduling involves specifying and controlling the time required for each step in the production process. The operations manager prepares timetables showing the most efficient sequence of production and then tries to ensure that the necessary materials and labor are in the right place at the right time.

Scheduling is important to both manufacturing and service firms. The production manager in a factory schedules material deliveries, work shifts, and production processes. Trucking companies schedule drivers, clerks, truck maintenance, and repairs in accordance with customer transportation needs. Scheduling at a college entails deciding when to offer which courses, in which classrooms, with which instructors. A museum must schedule special exhibits, ship works to be displayed, market its offerings, and conduct educational programs and tours. Scheduling can range from simple to complex. Giving numbers to customers waiting to be served in a bakery and making interview appointments with job applicants are examples of simple scheduling. Organizations that must produce large quantities of products or services or service a diverse customer base face more complex scheduling problems.

Three common scheduling tools used for complex situations are Gantt charts, the critical path method, and PERT.

## *Tracking Progress with Gantt Charts*

Named after their originator, Henry Gantt, Gantt charts are bar graphs plotted on a time line that show the relationship between scheduled and actual production.

In the example shown in **(Figure)**, the left side of the chart lists the activities required to complete the job or project. Both the scheduled time and the actual time required for each activity are shown, so the manager can easily judge progress.

Gantt charts are most helpful when only a few tasks are involved, when task times are relatively long (days or weeks rather than hours), and when job routes are short and simple. One of the biggest shortcomings of Gantt charts is that they are static. They also fail to show how tasks are related. These problems can be solved, however, by using two other scheduling techniques, the critical path method and PERT.

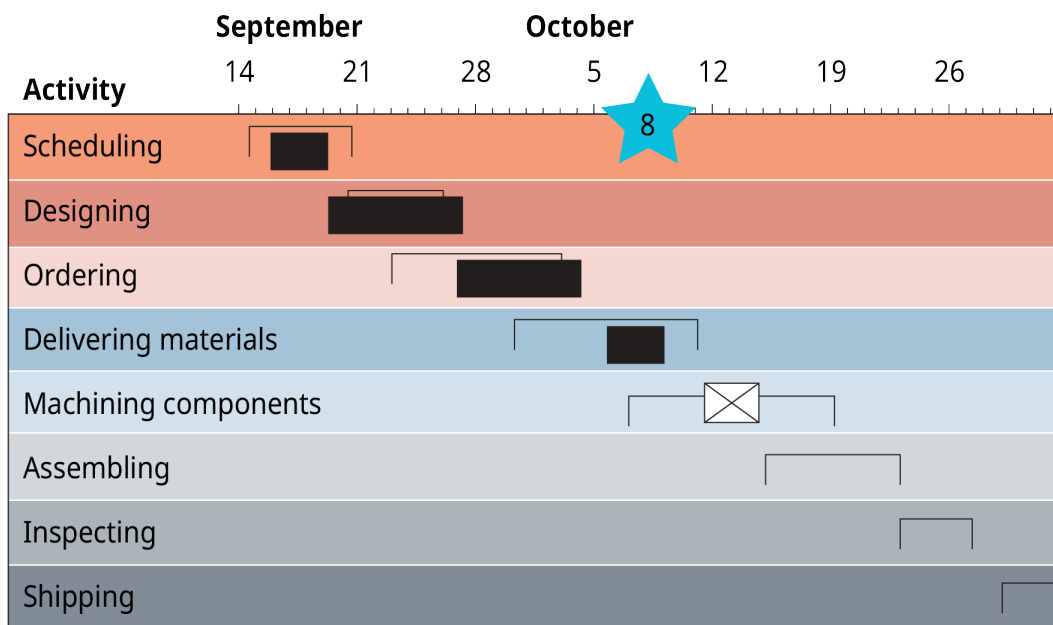
## *The Big Picture: Critical Path Method and PERT*

To control large projects, operations managers need to closely monitor resources, costs, quality, and budgets. They also must be able to see the “big picture”—the interrelationships of the many different tasks necessary to complete the project. Finally, they must be able to revise scheduling and divert resources quickly if any tasks fall behind schedule. The critical path method (CPM) and the program evaluation and review technique (PERT) are related project management tools that were developed in the 1950s to help managers accomplish this.

In the critical path method (CPM), the manager identifies all of the activities required to complete the project, the relationships between these activities, and the order in which they need to be completed. Then, the manager develops a diagram that uses arrows to show how the tasks are dependent on each other. The longest path through these linked activities is called the critical path. If the tasks on the critical path are not completed on time, the entire project will fall behind schedule.

To better understand how CPM works, look at **(Figure)**, which shows a CPM diagram for constructing a house. All of the tasks required to finish the house and an estimated time for each have been identified. The arrows indicate the links between the various steps and their required sequence. As you can see, most of the jobs to be done can't be started until the house's foundation and frame are completed. It will take five days to finish the foundation and another seven days to erect the house frame. The activities linked by brown arrows form the critical path for this project. It tells us that the fastest possible time the house can be built is 38 days, the total time needed for all of the critical path tasks. The noncritical path jobs, those connected with black arrows, can be delayed a bit or done early. Short delays in installing appliances or roofing won't delay construction of the house because these activities don't lie on the critical path.

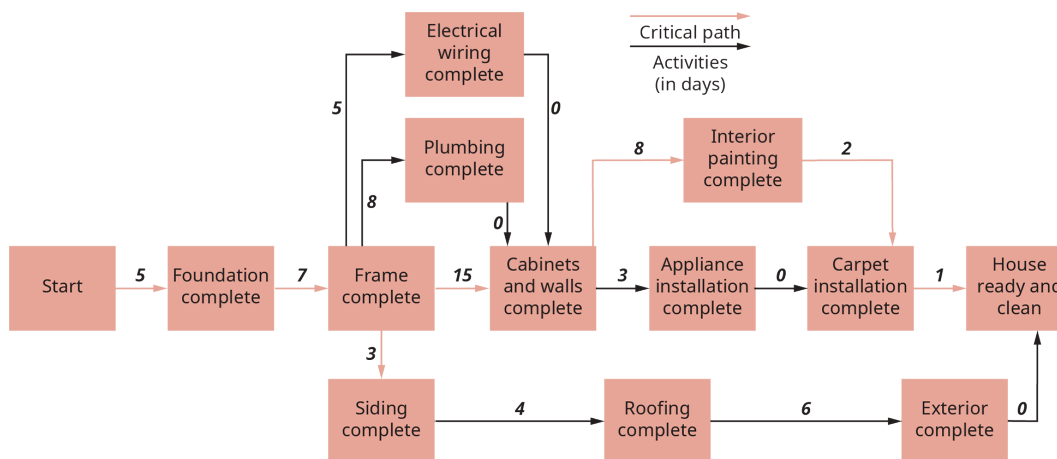




A Typical Gantt Chart  
(Attribution: Copyright Rice University, OpenStax, under CC BY 4.0 license.)

### Symbols:

- Scheduled start of activity
- Scheduled end of activity
- Review date
- Completed work
- Time not available (because of machine maintenance, material shortages, and so on)



A CPM Network for Building a House  
(Attribution: Copyright Rice University, OpenStax, under CC BY 4.0 license.)

Like CPM, the program evaluation and review technique (PERT) helps managers identify critical tasks and assess how delays in certain activities will affect operations or production. In both methods, managers use diagrams to see how operations and production will flow. PERT differs from CPM in one important respect. CPM assumes that the amount of time needed to finish a task is known with certainty; therefore, the CPM diagram shows only one number for the time needed to complete each activity. In contrast, PERT assigns three time estimates for each activity: an optimistic time for completion, the most probable time, and a pessimistic time. These estimates allow managers to anticipate delays and potential problems and schedule accordingly.

1. What is production control, and what are its key aspects?
2. How can value-stream mapping improve routing efficiency?
3. Identify and describe three commonly used scheduling tools.

## Summary of Learning Outcomes

5. How do operations managers schedule and control production?

Routing is the first step in scheduling and controlling production. Routing analyzes the steps needed in production and sets out a workflow, the sequence of machines and operations through which a product or service progresses from start to finish. Good routing increases productivity and can eliminate unnecessary cost. Scheduling involves specifying and controlling the time and resources required for each step in the production process. Operations managers use three methods to schedule production: Gantt charts, the critical path method, and PERT.

### Glossary

**critical path**

In a critical path method network, the longest path through the linked activities.

**critical path method (CPM)**

A scheduling tool that enables a manager to determine the critical path of activities for a project—the activities that will cause the entire project to fall behind schedule if they are not completed on time.

**Gantt charts**

Bar graphs plotted on a time line that show the relationship between scheduled and actual production.

**program evaluation and review technique (PERT)**

A scheduling tool that is similar to the CPM method but assigns three time estimates for each activity (optimistic, most probable, and pessimistic); allows managers to anticipate delays and potential problems and schedule accordingly.

**routing**

The aspect of production control that involves setting out the work flow—the sequence of machines and operations through which the product or service progresses from start to finish.

**scheduling**

The aspect of production control that involves specifying and controlling the time required for each step in the production process.

**value-stream mapping**

Routing technique that uses simple icons to visually represent the flow of materials and information from suppliers through the factory to customers.

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## 22. Distributing products and supply chain management

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### 4. How can supply-chain management increase efficiency and customer satisfaction?

Supply chain management plays a large role in the world we live in. In this lesson, you'll learn what supply chain management is and discuss the importance of supply chain management to business.

### What's Supply Chain Management?

At some point in your life someone has asked you this very important question: 'What's for dinner?' There must be a million possible answers to that question. Pizza? Tacos? Lamb chops? No matter what your answer is, none of these foods will just appear out of nowhere. They have to first move from their original raw state into the packaged products you buy in the store. In other words, they have to go along a supply chain.

In fact, everything you've ever purchased has been available to you because it was a part of a supply chain. A **supply chain** is the network of businesses and people that work together to move raw materials into finished goods and eventually to the end-user. The supply chain is directly or indirectly responsible for fulfilling your needs.

**Supply chain management** (SCM) is the active integration and coordination of all supply chain activities to provide you, the customer, with the best value. Providing you with the best value means providing you with a quality product for a reasonable price. Companies are able to provide customer value by coordinating the efforts of every activity involved in their supply chains internally as well as externally among supply chain members.

### How a Supply Chain Works

Believe it or not, the supply chain starts with you. Let's imagine, for instance, that you love shoes. Your desire to acquire shoes sets off a chain reaction. You either go to the store or shop online to get the shoes you want. The retailer obtains the shoes from the distributor. The distributor gets the shoes from the manufacturer. The manufacturer gets the raw material from someone else. So all these people, businesses, and processes are linked together. They are part of a supply chain that begins with you.

There is a constant flow of information, money, and products throughout the supply chain. This information, money, and products can be likened to the lubricant used to protect gears. Without the lubricant as protection, gears cease to function properly. The same is true for a supply chain; without information, money, or products acting as lubrication for its gears, a supply chain ceases to function properly.

When you purchase the shoes, you exchange information, money, and products with the retailer. The retailer, in turn, does the same thing with the distributor, and so it goes. Money flows **upstream**, from the customer to supply chain members. Products flow **downstream**, from supply chain members to the end-user. Information, however, moves both upstream and downstream.

## Why Is SCM Important?

SCM is important because it increases competitiveness and customer satisfaction. In this day and age, SCM plays an integral part of a firm's success. Efficiently running supply chains allow firms to quickly deliver products to the end-user for a low cost. Firms are able to sell more products and thus increase their competitiveness. Firms are able to better compete against other firms.

Consumers have higher expectations than they have had in the past. They want better products, faster service, and lower prices. When firms have efficiently run supply chains, customers benefit from product availability and lower cost. Consumers are happy because they're able to get the products they want for the prices they want.

A **supply chain** is a network of businesses and people that are directly or indirectly responsible for fulfilling your needs. **Supply chain management**, or SCM, is the active integration and coordination of all supply chain activities with the objective of providing you with the best value.

The customer is the beginning of the supply chain. A supply chain has three flows:

1. Money flows **upstream** from the customer to the supply chain members
2. Information flows both ways
3. Products flow **downstream** from supply chain members to the end user

## Definition

Before you can understand the benefits and best practices of supply chain management, you need to understand what it is. A **supply chain** is the network of partners that a business uses to move its product from one stage of development to another.

For instance, Sparkle Designs purchases jewels from Green Mine, Inc. It then creates custom jewelry designs, which are sold at several jewelers throughout the United States. Everyone that participates in this process is part of the supply chain. This would include such businesses as a distributor, a supplier, or a retail store. It would also include the customer, since the customer's demand for a product is the catalyst for a business to supply it.

**Supply chain management** is a systematic approach to integrating and managing all functions related to producing a product. This approach includes:

- Sourcing and procuring products
- Product design
- Production planning
- Material handling
- Inventory management
- Customer service
- Order processing
- Warehousing
- Transportation

## Benefits

Now that you have a good understanding of what supply chain management is, imagine that you are the supply chain

manager at Sparkle Designs. What type of benefits do you think you'd gain from supply chain management? What type of benefits do you want to gain? Both of those questions are important, because there are many benefits to be gained from supply chain management. However, you're unlikely to gain all of them.

Supply chain management uses an analytical approach to improving the supply chain. Its benefits may include the reduction of waste, shipping delays, or overhead. Past data, such as sales reports or other financial reports, are used to understand past trends and create future forecasts for inventory. Forecasting inventory based on past trends helps you to reduce overhead, since you have a better idea of how much inventory you will need and when.

Past data may also provide information to determine an optimal way of shipping, which could help you reduce shipping costs and/or reduce shipping delays. As in life, in business, there are always tradeoffs. So as the supply chain manager, you need to decide which benefits are more important to your business. Finding the best shipping company for Sparkle Designs may mean that you have to decide between lower shipping costs or fewer shipping delays, because you may not be able to find both benefits in one shipper. Is it more important for Sparkle Designs to have a lower shipping cost or a faster delivery? It should be noted that the answer to this question may change over time, or depend on your customers' needs.

Using past data to determine future actions also helps firms to mitigate risk related to purchasing materials and delivering products. Since you'll have a better understanding of past successes and failures, you're better able to make decisions. This will allow you to improve operations and gain a competitive advantage.

## Best Practices

Each supply chain is unique to its company. Therefore, the opportunities to use it to gain an advantage over your competitors are endless. One way that firms use their supply chains to gain an advantage is by establishing supply chain best practices. **Best practices** are a set of procedures that your firm has identified as being the most effective for them. It's vitally important to create best practices that enhance your firm's performance.

When choosing best practices, you want to look at your strengths and weaknesses. Then develop best practices that enhance the strengths that you have and negate the weaknesses. For instance, Sparkle Designs is a small business with only four employees: the owner, the designer, the salesperson, and you, the supply chain guru. Since you're a small firm, you may not have the capital to purchase the latest software to manage your inventory. However, you can make technology a best practice by using it to drive sales. After all, the customer is part of the supply chain, and without sales, there is no need for inventory or a supply chain.

You may also establish partnerships with other small businesses, thereby reducing shipping costs and delays by working together. If being green is an important consideration, you can develop supply chain relationships with other green businesses and advertise this best practice to consumers. This in turn could help you drive sales, reduce waste, and improve your overall performance. The most important thing to remember about supply chain management is that it's a team activity. Best practices should not only improve your performance, but also enhance the performance of your entire supply chain.

SCM is important because it increases a firm's competitiveness by providing fast service to customers and lower prices. This, in turn, leads to increased customer satisfaction.

Distribution (place) is an important part of the marketing mix. Retailers don't sell products they can't deliver, and salespeople don't (or shouldn't) promise deliveries they can't make. Late deliveries and broken promises may mean the loss of a customer. Accurate order filling and billing, timely delivery, and arrival in good condition are important to the success of the product.

The goal of supply-chain management is to create a satisfied customer by coordinating all of the activities of the supply-chain members into a seamless process. Therefore, an important element of supply-chain management is that it is completely customer driven. In the mass-production era, manufacturers produced standardized products that were

“pushed” through the supply channel to the consumer. In contrast, in today’s marketplace, products are being driven by customers, who expect to receive product configurations and services matched to their unique needs. For example, Dell builds computers according to its customers’ precise specifications, such as the amount of memory, type of monitor, and amount of hard-drive space. The process begins with Dell purchasing partly built laptops from contract manufacturers. The final assembly is done in Dell factories in Ireland, Malaysia, or China, where microprocessors, software, and other key components are added. Those finished products are then shipped to Dell-operated distribution centers in the United States, where they are packaged with other items and shipped to the customer.

Through the channel partnership of suppliers, manufacturers, wholesalers, and retailers along the entire supply chain who work together toward the common goal of creating customer value, supply-chain management allows companies to respond with the unique product configuration demanded by the customer. Today, supply-chain management plays a dual role: first, as a *communicator* of customer demand that extends from the point of sale all the way back to the supplier, and second, as a *physical flow process* that engineers the timely and cost-effective movement of goods through the entire supply pipeline.

Accordingly, supply-chain managers are responsible for making channel strategy decisions, coordinating the sourcing and procurement of raw materials, scheduling production, processing orders, managing inventory, transporting and storing supplies and finished goods, and coordinating customer-service activities. Supply-chain managers are also responsible for the management of information that flows through the supply chain. Coordinating the relationships between the company and its external partners, such as vendors, carriers, and third-party companies, is also a critical function of supply-chain management. Because supply-chain managers play such a major role in both cost control and customer satisfaction, they are more valuable than ever.

For products that are services, the distribution channel is based primarily on location of the services, such as where the company has its headquarters; the layout of the area in which the service is provided (for example, the interior of a dry cleaners’ store); alternative locations for the presentation of services, such as an architect visiting a client’s site location; and elements of atmosphere, such as dark wooden bookcases for bound legal volumes in an attorney’s office, which provide credibility. Services companies also utilize the traditional entities of distribution for any actual goods they sell or supplies they must purchase.

1. What is the goal of supply-chain management?
2. What does it mean for a supply chain to be customer driven?
3. How does distribution (place) differ for services products?

## Summary of Learning Outcomes

4. How can supply-chain management increase efficiency and customer satisfaction?

The goal of supply-chain management is to coordinate all of the activities of the supply-chain members into a seamless process, thereby increasing customer satisfaction. Supply-chain managers have responsibility for main channel strategy decisions, coordinating the sourcing and procurement of raw materials, scheduling production, processing orders, managing inventory, transporting and storing supplies and finished goods, and coordinating customer-service activities.

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## 23. Trends in Production and Operations Management

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### 8. What key trends are affecting the way companies manage production and operations?

What trends will impact U.S. production and operations management both now and in the future? Manufacturing employment has added one million manufacturing factory jobs since the end of the great recession, up to a level of 12.5 million in December 2017. U.S. exports have quadrupled over the past 25 years, and the integration of technology into manufacturing processes has made U.S. manufacturers more competitive. These statistics portray a U.S. economy that is steaming ahead.

National Association of Manufacturers, “Top 20 Facts About Manufacturing,” <http://www.nam.org>, accessed February 20, 2018.

Yet rapid changes in technology and intense global competition—particularly from Asia—create anxiety about the future. Is technology replacing too many jobs? Or, with qualified workers predicted to be in short supply, is the increased reliance on technology imperative to the United States’ ability to compete in a global marketplace? Will the United States lose its edge in the ongoing war for leadership in innovation? And what should it be doing to ensure that today’s students are tomorrow’s innovators and scientists?

Recent surveys show finding qualified workers continues to be a major concern facing U.S. industry today. If the United States is to maintain its competitive edge, more investment—both private and federal—is needed for science and research. And what about the crucial role of technology? These are some of the trends facing companies today that we will examine.

U.S. workers no longer compete simply against one another but also against workers in less-developed countries with lower wages and increasing access to modern technology and production techniques. This is particularly true for manufacturers who account for the bulk of U.S. exports and compete directly with most imports. A more integrated global economy with more import competition and more export opportunities offers both new challenges and new opportunities to the United States and its workforce. To maintain its position as the world’s leading innovator, it is essential that the United States remain committed to innovation and the concerted development of a more highly educated and skilled workforce.

### Looming Workforce Crisis Threatens U.S. Competitiveness

According to the latest National Association of Manufacturers Skills Gap Report, manufacturing executives rank a “high-performing workforce” as the most important factor in their firms’ future success. This finding concurs with a recent study by the U.S. Department of Labor, which concluded that 85 percent of future jobs in the United States will require advanced training, an associate degree, or a four-year college degree. Minimum skills will be adequate for only 15 percent of future jobs.

But the National Association of Manufacturers predicts that 3.5 million new jobs will be filled over the next decade, but two million jobs will go unfilled due to a skills gap. When asked to identify the most serious problem for their company, survey respondents ranked “finding qualified employees” above high energy costs and the burdens of taxes, federal regulations, and litigation. Only the cost of health insurance and import competition ranked as more pressing concerns.

As demand for better-educated and more highly skilled workers begins to grow, troubling trends project a severe



shortage of such workers. U.S. employers already struggling to find qualified workers will face an increasing shortage of such workers in coming years. To make matters worse, trends in U.S. secondary education suggest that even those future workers who stay in school to study math and science may not receive globally competitive educations. Ibid.

## American Innovation Leadership at Risk

A recently released report shows the United States is in danger of losing its global lead in science and innovation for the first time since World War II. The report was prepared by the Task Force on the Future of American Innovation, a coalition of leaders from industry, science, and higher education. Although the United States is still out front of the world's innovation curve, competing countries are climbing the technology ladder quickly, and the only way the United States can continue to create high-wage, value-added jobs is to climb the innovation ladder faster than the rest of the world.

The task force identified dwindling federal investment in science and research as a root cause of the problem. Federal research as a share of GDP has declined 40 percent over the past 40 years.

Matt Hourihan and David Parkes, "AAAS Appropriations Roundup," <http://www.innovationtaskforce.org>, September 16, 2016.

The U.S. share of worldwide high-tech exports has been in a 10-year decline since 2008, after a dramatic rise from \$77 billion in 1990 to \$221 billion in 2008. The latest data has the U.S. high-tech exports at \$153 billion. Similarly, graduate science and engineering enrollment is declining in the United States while on the rise in China, India, and elsewhere. In addition, retirements from science and engineering jobs here at home could lead to a critical shortage of U.S. talent in these fields in the near future.

World Bank, "High-Technology Exports," <https://data.worldbank.org>, accessed February 20, 2018.

So what needs to be done to reverse this alarming trend? More robust investment is part of the solution because federally funded, peer-reviewed, and patented scientific advances are essential to innovation. Such basic research helped bring us lasers, the World Wide Web, magnetic resonance imaging (MRI), and fiber optics. National Association of Manufacturers President Jay Timmons noted that, "Modern manufacturing offers high-paying, long-term careers. It's a high-tech, sleek industry. It's time to close the skills gap and develop the next generation of the manufacturing workforce."

National Association of Manufacturers, "Manufacturers Strive to Close Skills Gap," <https://www.nahad.org>, accessed February 20, 2018.

## Business Process Management (BPM)—The Next Big Thing?

The twenty-first century is the age of the scattered corporation. With an assortment of partners and an army of suppliers often spread across thousands of miles, many companies find themselves with global design, supply, and logistics chains stretched to the breaking point. Few firms these days can afford to go it alone with their own raw materials, in-house production processes, and exclusive distribution systems.

Benjamin Brandell, "What Is Business Process Management? A Really Simple Introduction," *Business 2 Community*, <https://www.business2community.com>, August 18, 2016.

"Business Process Management is the glue to bind it all together," says Eric Austvold, research director at AMR Research.

“It provides a unified system for business.” This technology has the power to integrate and optimize a company’s sprawling functions by automating much of what it does. The results speak for themselves. BPM has saved U.S. firms \$117 billion a year on inventory costs alone. Defense contractor Lockheed Martin recently used a BPM system to resolve differences among the hundreds of businesses that it acquired, unifying them into a whole and saving \$50 million per year by making better use of existing resources and data.

BPM is the key to the success of such corporate high-flyers as Walmart and Dell, which collect, digest, and utilize all sorts of production, sales, and shipping data to continually hone their operations. So how does BPM actually work? When a Dell system is ordered online, rather than waiting for a person to get the ball rolling, a flurry of electronic traffic flows back and forth between suppliers so that every part arrives within a few hours and the computer’s assembly, as well as software loading and testing, are scheduled. Production runs like a well-oiled clock so customers get their computers quickly, and Dell can bill them on shipment. A well-thought-through BPM system can even reschedule production runs, reroute deliveries, or shift work to alternate plants. The key, says Byron Canady of Dell, is “to stay close to customers and the supply chain.”

Dave Blanchard, “Dell Reinvents Its Supply Chain,” *Industry Week*, <http://www.industryweek.com>, December 16, 2010.

The amount of available data—business intelligence (BI), enterprise resource planning (ERP), customer relationship management (CRM), and other systems—is staggering. “Companies are flooded with information,” says Jeanne Baker, chair of the industry support group Business Process Management Initiative (BPMI) and vice president of technology at Sterling Commerce. “The challenge is to make sense of it all. How you leverage the value chain is the true competitive advantage of the 21st century.” According to Baker, “BPMI drives growth through the automation of business processes, particularly the processes that integrate organizations. These provide the best opportunities for growth. Studies have shown companies that have good collaborative processes experience 15 percent less inventory; 17 percent stronger order fulfillment; 35 percent shorter cash-to-cash cycles; 10 percent less stock outs; 7 to 8 percent increase in revenues from savings; and overall sales increases.”

“Business Value of Process Standards,” <http://www.bpmiinstitute.org>, accessed February 20, 2018.

1. Describe the impact of the anticipated worker shortage on U.S. business.
2. How are today’s educational trends affecting the future of manufacturing?
3. What is business process management (BPM), and how do businesses use it to improve operations management?

## Summary of Learning Outcomes

8. What key trends are affecting the way companies manage production and operations?

Data show the U.S. economy steaming steadily ahead, but dramatic advances in technology, predicted worker shortages, and global competition create challenges for the future. How will companies balance their technology and workforce needs? Will the United States maintain its lead in the ongoing war for leadership in innovation? And what should it be doing to convert today’s students into tomorrow’s innovators and scientists? Surveys indicate that finding qualified workers continues to be a major concern facing U.S. industry today. If the United States is to maintain its competitive edge, more private and federal investment is needed for science and research. And what of the increasingly crucial role of technology? These are some of the trends facing companies today.

## Preparing for Tomorrow’s Workplace Skills

1. Tom Lawrence and Sally Zickle are co-owners of L-Z Marketing, an advertising agency. Last week, they landed a

major aerospace manufacturer as a client. The company wants the agency to create its annual report. Tom, who develops the art for the agency, needs about a week to develop the preliminary report design, another two weeks to set the type, and three weeks to get the report printed. Sally writes the material for the report and doesn't need as much time: two days to meet with the client to review the company's financial information and about three weeks to write the report copy. Of course, Tom can't set type until Sally has finished writing the report. Sally will also need three days to proofread the report before it goes to the printer. Develop either a Gantt chart or a critical path diagram for Tom and Sally to use in scheduling the project. Explain why you chose the method you did. How long will it take Tom and Sally to finish the project if there are no unforeseen delays? (Resources, Systems)

2. Look for ways that technology and automation are used at your school, in the local supermarket, and at your doctor's office. As a class, discuss how automation affects the service you receive from each of these organizations. Does one organization use any types of automation that might be effectively used by one of the others? Explain. (Interpersonal, Information)
3. Pick a small business in your community. Make a list of the resources critical to the firm's production and operations. What would happen if the business suddenly couldn't acquire any of these resources? Divide the class into small groups and discuss strategies that small businesses can use to manage their supply chain. (Resources, Information, Interpersonal)
4. Broadway Fashions is a manufacturer of women's dresses. The company's factory has 50 employees. Production begins when the fabric is cut according to specified patterns. After being cut, the pieces for each dress style are placed into bundles, which then move through the factory from worker to worker. Each worker opens each bundle and does one assembly task, such as sewing on collars, hemming dresses, or adding decorative items such as appliqués. Then, the worker puts the bundle back together and passes it on to the next person in the production process. Finished dresses are pressed and packaged for shipment. Draw a diagram showing the production process layout in Broadway Fashions' factory. What type of factory layout and process is Broadway using? Discuss the pros and cons of this choice. Could Broadway improve production efficiency by using a different production process or factory layout? How? Draw a diagram to explain how this might look. (Resources, Systems)
5. As discussed in this chapter, many U.S. firms have moved their manufacturing operations to overseas locations in the past decade. Although there can be sound financial benefits to this choice, moving production overseas can also raise new challenges for operations managers. Identify several of these challenges, and offer suggestions for how operations managers can use the concepts in this chapter to minimize or solve them. (Resources, Information)
6. **Team Exercise** Reliance Systems, headquartered in Oklahoma City, is a manufacturer of computer keyboards. The company plans to build a new factory and hopes to find a location with access to low-cost but skilled workers, national and international transportation, and favorable government incentives. Working in teams, assign tasks, and use the internet and your school library to research possible site locations, both domestic and international. Choose a location you feel would best meet the company's needs. Make a group presentation to the class explaining why you have chosen this location. Include information about the location's labor force, similar manufacturing facilities already located there, availability of resources and materials, possible local incentives, political and economic environment in the location, and any other factors you feel make this an attractive location. After all teams have presented their proposed locations, as a class rank all of the locations and decide the top two Reliance should investigate further. (Interpersonal, Information)
7. Your teacher has just announced a huge assignment, due in three weeks. Develop a Gantt chart to plan and schedule more effectively.
  - Break the assignment down into smaller tasks: pick a topic; conduct research at the library or on the internet; organize your notes; develop an outline; and write, type, and proofread the paper.
  - Estimate how much time each task will take.
  - Across the top of a piece of paper, list all the days until the assignment is due. Along the side of the paper, list all the tasks you've identified in the order they need to be done.
  - Starting with the first task, block out the number of days you estimate each task will take. Include days that

- you won't be able to work on the project.
- Track the actual time spent on each task.

After you complete and submit your assignment, compare your time estimates to the actual time each task took. How can these findings help you with future assignments? (Resources, Systems)

## Ethics Activity

A recent spate of mine disasters that caused numerous fatalities refocused national attention on the question: is management doing enough to protect employees on the job? Recent serious Occupational Safety and Health Administration (OSHA) violations resulting in the deaths of two workers from falls due to the lack of harnesses or guardrails suggest there is still a long way to go.

Companies are responsible for providing a safe workplace for employees. So why do accidents like these continue to happen? In a word—money. It takes money to purchase harnesses, install guardrails, and otherwise ensure a safe and healthy work environment. And even more is needed to employ the staff necessary to enforce company safety policies. It is often less costly for a company to just pay the fines that are levied for violations.

As a supervisor at a company with frequent violations of OSHA regulations, you worry about your employees' safety. But each time your company needs to implement a new safety feature, end-of-year employee bonuses get smaller. The money has to come from somewhere, management claims.

Using a web search tool, locate articles about this topic, and then write responses to the following questions. Be sure to support your arguments and cite your sources.

**Ethical Dilemma:** Do you report safety violations to management in the hope they will be corrected before someone gets hurt, or do you stage a total work stoppage to force management's hand, knowing that either way you risk losing popularity at every level, and very possibly your job? Or, of course, you could say nothing and hope for the best. It is not a problem you created, and you're just there to do a job, after all.

Sources: George Avalos, "PG&E Violated Safety Rules, Was Late on Thousands of Wine Country Electricity Inspections and Work Orders," *The Mercury News*, <https://www.mercurynews.com>, October 25, 2017; Barry Meier and Danielle Ivory, "Worker Safety Rules Are Among Those Under Fire in Trump Era," *The New York Times*, <https://www.nytimes.com>, March 13, 2017; Kenneth Cheng, "Senior Managers Could Be Taken to Task for Workplace Safety Violations," *Today Online*, <http://www.todayonline.com>, March 7, 2017.

## Working the Net

1. Use the Google search engine, <http://www.google.com>, to conduct a search for "supplier information," and visit the websites of several firms (for example, Walmart, Northrop Grumman, Verizon, etc.). Compare the requirements companies set for their suppliers. How do they differ? How are they similar?
2. Visit *Site Selection* magazine, <http://www.siteselection.com>. Click on Area Spotlights for information about the manufacturing environment in various U.S. locations. Pick three to four areas to read about. Using this information, what locations would you recommend for firms in the following industries: general services, telecommunications, automotive manufacturing, and electronics manufacturing? Explain.
3. Manufacturers face many federal, state, and local regulations. Visit the National Association of Manufacturers at <http://www.nam.org>. Pick two or three legislative or regulatory issues discussed under their Policy sections, and use a search engine such as Yahoo! (<http://www.yahoo.com>) to find more information.
4. Using a search engine to search for information about technologies such as ERP, CAD/CAM systems, or robotics.

Find at least three suppliers for one of these technologies. Visit their websites, and discuss how their clients are using their products to automate production.

5. Research either the Malcolm Baldrige National Quality Award or the ISO 9000 Quality Standards program on the internet. Write an executive summary that explains the basic requirements and costs of participating. What are the benefits of participating? Include a brief example of a company that has participated and their experiences. Include a list of relevant website links for further reading.

## Creative Thinking Case

### *Innovation and E-mail Rules*

This chapter provides insights into how manufacturing and service organizations can implement processes and controls to increase efficiency, manage expenditures, and increase profits for the organization. For companies such as General Motors that need to manage suppliers and make sure that all components are procured on time and at the best costs to ensure the final assembly runs efficiently, and for service organizations such as Marriott, which wants to have clean rooms and an efficient check-in process when guests arrive, the main lessons of this chapter are readily apparent.

All companies, however, need to innovate continuously to improve their products and services. Automobile companies such as General Motors have to constantly measure customer tastes and needs and provide products that meet and exceed their expectations. Likewise, Marriott needs to cater to the needs of business and leisure travelers in a variety of locations.

Perhaps no company in recent years has captured the attention of the public more than Tesla and SpaceX, both headed by CEO Elon Musk. Tesla is named after the inventor Nicola Tesla, a contemporary of Thomas Edison, who designed the first electric engine. SpaceX is a company that is known for innovation such as reusing rocket launchers to reduce costs. While Tesla and SpaceX still manage their operations with all the processes covered in this chapter, their constant innovation requires new processes.

Perhaps no aspect of modern business has had a bigger impact than the proliferation of e-mail. No longer confined to the desktop, e-mail messages are delivered via mobile devices, and managers must find ways to manage the proliferation of communication to keep on top of things.

Elon Musk communicated the processes and rules for communicating at Tesla in this e-mail to all employees.

Subject: Communication Within Tesla

There are two schools of thought about how information should flow within companies. By far the most common way is chain of command, which means that you always flow communication through your manager. The problem with this approach is that, while it serves to enhance the power of the manager, it fails to serve the company.

Instead of a problem getting solved quickly, where a person in one dept talks to a person in another dept and makes the right thing happen, people are forced to talk to their manager who talks to their manager who talks to the manager in the other dept who talks to someone on his team. Then the info has to flow back the other way again. This is incredibly dumb. Any manager who allows this to happen, let alone encourages it, will soon find themselves working at another company. No kidding.

Anyone at Tesla can and should email/talk to anyone else according to what they think is the fastest way to solve a problem for the benefit of the whole company. You can talk to your manager's manager without his permission, you can talk directly to a VP in another dept, you can talk to me, you can talk to anyone without anyone else's permission. Moreover, you should consider yourself obligated to do so

until the right thing happens. The point here is not random chitchat, but rather ensuring that we execute ultra-fast and well. We obviously cannot compete with the big car companies in size, so we must do so with intelligence and agility.

One final point is that managers should work hard to ensure that they are not creating silos within the company that create an us vs. them mentality or impede communication in any way. This is unfortunately a natural tendency and needs to be actively fought. How can it possibly help Tesla for depts to erect barriers between themselves or see their success as relative within the company instead of collective? We are all in the same boat. Always view yourself as working for the good of the company and never your dept.

Thanks,

Elon

### Critical Thinking Questions

1. Why would an e-mail rules memo like this work better at an innovation-driven company such as Tesla rather than at a manufacturing-driven company such as General Motors?
2. What are the potential problems that could arise out of this approach to e-mail?

Sources: Justin Bariso, "This Email From Elon Musk to Tesla Employees Describes What Great Communication Looks Like," *Inc.*, <https://www.inc.com>, accessed February 20, 2018; John F. Wasik, "Tesla the Car Is a Household Name. Long Ago, So Was Nikola Tesla," *The New York Times*, <https://www.nytimes.com>, December 30, 2017; Ken Costlow, "Ground Broken on New General Motors Supplier Park," *Arlington Voice*, <https://arlingtonvoice.com>, June 19, 2017.

### Hot Links Address Book

1. See how American Leather brings it all together to create beautiful customized couches at <https://www.americanleather.com>.
2. What characteristics contribute to a city's manufacturing climate? Find out by reading more at *Industry Week's* website: <http://www.industryweek.com>.
3. How do companies decide whether to make or buy? Find out more at the Outsourcing Institute, a professional association where buyers and sellers network and connect: <http://www.outsourcing.com>.
4. Learn how to build your own Gantt chart at [https://www.mindtools.com/pages/article/newPPM\\_03.htm](https://www.mindtools.com/pages/article/newPPM_03.htm).
5. What does it take to win the Malcolm Baldrige National Quality Award? Get the details at <https://www.nist.gov/baldrige/baldrige-award>.
6. Want to know more about how robots work? Find out at <https://science.howstuffworks.com/robot.htm>.

## Glossary

### **business process management (BPM)**

A unified system that has the power to integrate and optimize a company's sprawling functions by automating much of what it does.

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PART IV

## CHAPTER 4: COMPETING IN THE GLOBAL MARKETPLACE



# 24. Introduction

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## Learning Objectives

**After reading this chapter, you should be able to answer these questions:**

1. Why is global trade important to the United States, and how is it measured?
2. Why do nations trade?
3. What are the barriers to international trade?
4. How do governments and institutions foster world trade?
5. What are international economic communities?
6. How do companies enter the global marketplace?
7. What threats and opportunities exist in the global marketplace?
8. What are the advantages of multinational corporations?
9. What are the trends in the global marketplace?

### Mike Schlater Domino's Pizza

Domino's Pizza has more than 14,000 stores worldwide. As executive vice president of Domino's Pizza's international division, Mike Schlater is president of Domino's Canada with more than 440 stores. Originally from Ohio, Schlater started his career with Domino's as a pizza delivery driver and worked his way up into management. Schlater saved his earnings, and with some help from his brother, he was able to accept the opportunity to have the first international Domino's franchise in Winnipeg, Manitoba, in 1983. Within weeks, Schlater's store in Canada reached higher sales than his previous store in Ohio had ever attained. However, it was not an easy start. Schlater had to identify the international suppliers and get them approved to sell their products to Domino's. This shows one of the challenges that organizations face when entering new global markets. To meet quality standards designed to protect a brand, companies must

undertake an extensive review of potential new suppliers to ensure consistent product quality. By 2007, Schlater and a partner unified all of the franchises under one corporate umbrella, and Schlater is now president of Domino's of Canada, Ltd., which operates more than 440 stores located in every province, as well as the Yukon and Northwest Territories.



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Such an impressive career path might seem like luck to some, but Schlater achieved his success due to determination and attention to detail. Luck did play a role in a recent event in his life, though. Schlater manages dough in his business but also came into “dough” by winning \$250,000 in a lottery. Since Schlater believes in philanthropy, he donated the entire amount to Cardinal Carter High School in his hometown. Over the years, Schlater has donated millions of dollars to foundations and charities, such as The London Health Sciences Foundation, because he now has the ability to indulge after spending decades climbing the corporate ladder at Domino's Pizza. A father of three, he moved to Essex County from Winnipeg after buying the Domino's master franchise for Canada. He wanted to live close to the border because one of his daughters was in a private school in Ohio and another was headed to university there.

The master franchisees of Domino's Pizza's international business are individuals or entities who, under a specific licensing agreement with Domino's, control all operations within a specific country. They operate their own stores, set up a distribution infrastructure to transport materials into and throughout the country, and create sub-franchisees. One particular benefit of master franchisees is their local knowledge. As discussed in this chapter, a major challenge when opening a business on foreign soil is negotiating the political, cultural, and economic differences of that country. Master franchisees allow Domino's, and the franchisee, to take advantage of their local expertise in dealing with marketing strategies, political and regulatory issues, and the local labor market. It takes local experience to know, for example, that only 30 percent of the people in Poland have phones, so carryout needs to be the focus of the business; that Turkey has changed its street names three times in the past 30 years, so delivery is much more challenging; or that, in Japanese, there is no word for pepperoni, the most popular topping worldwide. These are just a few of the challenges that Domino's has had to overcome on the road to becoming the worldwide leader in the pizza delivery business. Under

the leadership of people like Schlater, and with the help of dedicated, local master franchisees, Domino's has been able to not only compete in but to lead the global pizza delivery market.

Sources: "Domino's Pizza Corporate Facts," <http://phx.corporate-ir.net>, accessed June 20, 2017; Domino's Canada website, <https://www.dominos.ca>, accessed June 20, 2017; Trevor Wilhelm, "Domino's CEO, who lives in Leamington, will donate \$250K lotto winnings to high school," *Windsor Star*, February 27, 2015.

This chapter examines the business world of the global marketplace. It focuses on the processes of taking a business global, such as licensing agreements and franchisees; the challenges that are encountered; and the regulatory systems governing the world market of the 21st century.

Today, global revolutions are under way in many areas of our lives: management, politics, communications, and technology. The word *global* has assumed a new meaning, referring to a boundless mobility and competition in social, business, and intellectual arenas. The purpose of this chapter is to explain how global trade is conducted. We also discuss the barriers to international trade and the organizations that foster global trade. The chapter concludes with trends in the global marketplace.

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# 25. Global Trade in the United States

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## 1. Why is global trade important to the United States, and how is it measured?

No longer just an option, having a global vision has become a business imperative. Having a global vision means recognizing and reacting to international business opportunities, being aware of threats from foreign competitors in all markets, and effectively using international distribution networks to obtain raw materials and move finished products to the customer.

U.S. managers must develop a global vision if they are to recognize and react to international business opportunities, as well as remain competitive at home. Often a U.S. firm's toughest domestic competition comes from foreign companies. Moreover, a global vision enables a manager to understand that customer and distribution networks operate worldwide, blurring geographic and political barriers and making them increasingly irrelevant to business decisions. Over the past three decades, world trade has climbed from \$200 billion a year to more than \$1.4 trillion.

International Trade Administration: US Department of Commerce Website, accessed August 1, 2017.

<http://tse.export.gov/tse/MapDisplay.aspx>.

U.S. companies play a major role in this growth in world trade, with 113 of the Fortune 500 companies making over 50 percent of their profits outside the United States. Among these companies are recognizable names such as Apple, Microsoft, Pfizer, Exxon Mobil, and General Electric.

"In the Stock Market, International Is Actually First," *New York Times*, May 21, 2017, Page BU6.

Starbucks Corp. is among the fastest growing global consumer brands and one of the most visible emblems of U.S. commercial culture overseas. Of Starbucks's 24,000 total stores, almost 66 percent are international stores that contribute a substantial amount to the company's revenues, which have grown from \$4.1 billion in 2003 to \$21.3 billion in 2016.

"Starbucks Coffee International," <https://www.starbucks.com>, accessed June 20, 2017; Trefis Team, "How Starbucks Plans to Grow Its International Operations," *Forbes*, <https://www.forbes.com>, January 18, 2016.

Go into a Paris McDonald's and you may not recognize where you are. There are no Golden Arches or utilitarian chairs and tables and other plastic features. The restaurants have exposed brick walls, hardwood floors, and armchairs. Some French McDonald's even have faux marble walls. Most restaurants have TVs with continuous music videos. You can even order an espresso, beer, and a chicken on focaccia bread sandwich. It's not America.

Global business is not a one-way street, where only U.S. companies sell their wares and services throughout the world. Foreign competition in the domestic market used to be relatively rare but now occurs in almost every industry. In fact, U.S. makers of electronic goods, cameras, automobiles, fine china, tractors, leather goods, and a host of other consumer and industrial products have struggled to maintain their domestic market shares against foreign competitors. Toyota now has 14 percent of the U.S. auto market, followed by Honda at 9 percent and Nissan with 8 percent.

"Market Share by Manufacturer, October 2016 Data," <https://www.edmunds.com>, accessed June 25, 2016.

Nevertheless, the global market has created vast new business opportunities for many U.S. firms.

## The Importance of Global Business to the United States

Many countries depend more on international commerce than the United States does. For example, France, Great Britain, and Germany all derive more than 55 percent of their gross domestic product (GDP) from world trade, compared to about 28 percent for the United States.

“Trade (% of GDP),” <http://data.worldbank.org>, accessed June 26, 2017.

Nevertheless, the impact of international business on the U.S. economy is still impressive:

- Trade-dependent jobs have grown at a rate three times the growth of U.S.-dependent jobs.
- Every U.S. state has realized a growth of jobs attributable to trade.
- Trade has an effect on both service and manufacturing jobs.

“The Impact of Trade on U.S. and State Level Employment,” <http://businessroundtable.org>, accessed June, 26, 2017.

These statistics might seem to imply that practically every business in the United States is selling its wares throughout the world, but most is accounted for by big business. About 85 percent of all U.S. exports of manufactured goods are shipped by 250 companies. Yet, 98 percent of all exporters are small and medium-size firms.

“Small Business Key Players in International Trade,” <https://www.sba.gov/sites/default/files/advocacy/Issue-Brief-11-Small-Biz-Key-Players-International-Trade.pdf>, June 26, 2017.

## The Impact of Terrorism on Global Trade

The terrorist attacks on America on September 11, 2001, and the Charlie Hebdo terrorist attacks in Paris in 2015 have changed the way the world conducts business. The immediate impacts of these events have included a short-term shrinkage of global trade. Globalization, however, will continue because the world’s major markets are too vitally integrated for globalization to stop. Nevertheless, terrorism has caused the growth to be slower and costlier.

“Globalization took hits in 2016; will 2017 lead to more?” <http://www.denverpost.com/2017/01/01/globalization-2016-and-2017/>, January 1, 2017.

Companies are paying more for insurance and to provide security for overseas staff and property. Heightened border inspections slow movements of cargo, forcing companies to stock more inventory. Tighter immigration policies curtail the liberal inflows of skilled and blue-collar workers that allowed companies to expand while keeping wages in check. The impact of terrorism may lessen over time, but multinational firms will always be on guard.

“How Venezuela Ruined Its Oil Industry,” <https://www.forbes.com/sites/rpapier/2017/05/07/how-venezuela-ruined-its-oil-industry/#4a066087399d>, May 7, 2017.

## Measuring Trade between Nations

International trade improves relationships with friends and allies; helps ease tensions among nations; and—economically speaking—bolsters economies, raises people’s standard of living, provides jobs, and improves the quality of life. The value of international trade is over \$16 trillion a year and growing. This section takes a look at some key measures of international trade: exports and imports, the balance of trade, the balance of payments, and exchange rates.

## Exports and Imports

The developed nations (those with mature communication, financial, educational, and distribution systems) are the major players in international trade. They account for about 70 percent of the world's exports and imports. Exports are goods and services made in one country and sold to others. Imports are goods and services that are bought from other countries. The United States is both the largest exporter and the largest importer in the world.

Each year the United States exports more food, animal feed, and beverages than the year before. A third of U.S. farm acreage is devoted to crops for export. The United States is also a major exporter of engineering products and other high-tech goods, such as computers and telecommunications equipment. For more than 60,000 U.S. companies (the majority of them small), international trade offers exciting and profitable opportunities. Among the largest U.S. exporters are Apple, General Motors Corp., Ford Motor Co., Procter & Gamble, and Cisco Systems.

Daniel Workman, "Top 10 Major Export Companies," <http://www.worldtopexports.com>, accessed July 4, 2017.

Despite our impressive list of resources and great variety of products, imports to the United States are also growing. Some of these imports are raw materials that we lack, such as manganese, cobalt, and bauxite, which are used to make airplane parts, exotic metals, and military hardware. More modern factories and lower labor costs in other countries make it cheaper to import industrial supplies (such as steel) and production equipment than to produce them at home. Most of Americans' favorite hot beverages—coffee, tea, and cocoa—are imported. Lower manufacturing costs have resulted in huge increases in imports from China.

## Balance of Trade

The difference between the value of a country's exports and the value of its imports during a specific time is the country's balance of trade. A country that exports more than it imports is said to have a *favorable* balance of trade, called a trade surplus. A country that imports more than it exports is said to have an *unfavorable* balance of trade, or a trade deficit. When imports exceed exports, more money from trade flows out of the country than flows into it.

Although U.S. exports have been booming, we still import more than we export. We have had an unfavorable balance of trade throughout the 1990s, 2000s and 2010s. In 2016, our exports totaled \$2.2 trillion, yet our imports were \$2.7 trillion. Thus, in 2016 the United States had a trade deficit of \$500 billion.

"U.S. Exports and Imports," <https://www.thebalance.com>, accessed June 26, 2017.

America's exports continue to grow, but not as fast as our imports: The export of goods, such as computers, trucks, and airplanes, is very strong. The sector that is lagging in significant growth is the export of services. Although America exports many services—ranging from airline trips to education of foreign students to legal advice—part of the problem is due to piracy, which leads companies to restrict the distribution of their services to certain regions. The FBI estimates that the theft of intellectual property from products, books and movies, and pharmaceuticals totals in the billions every year.

"What We Investigate: International Property Theft/Piracy," <https://www.fbi.gov>, accessed June 26, 2017.

## Balance of Payments

Another measure of international trade is called the balance of payments, which is a summary of a country's



international financial transactions showing the difference between the country's total payments to and its total receipts from other countries. The balance of payments includes imports and exports (balance of trade), long-term investments in overseas plants and equipment, government loans to and from other countries, gifts and foreign aid, military expenditures made in other countries, and money transfers in and out of foreign banks.

From 1900 until 1970, the United States had a trade surplus, but in the other areas that make up the balance of payments, U.S. payments exceeded receipts, largely due to the large U.S. military presence abroad. Hence, almost every year since 1950, the United States has had an unfavorable balance of payments. And since 1970, both the balance of payments and the balance of trade have been unfavorable. What can a nation do to reduce an unfavorable balance of payments? It can foster exports, reduce its dependence on imports, decrease its military presence abroad, or reduce foreign investment. The U.S. balance of payments deficit was over \$504 billion in 2016.

"International Economic Accounts," <https://www.bea.gov/International/index.htm>, accessed July 17, 2017.

## The Changing Value of Currencies

The exchange rate is the price of one country's currency in terms of another country's currency. If a country's currency *appreciates*, less of that country's currency is needed to buy another country's currency. If a country's currency *depreciates*, more of that currency will be needed to buy another country's currency.

How do appreciation and depreciation affect the prices of a country's goods? If, say, the U.S. dollar depreciates relative to the Japanese yen, U.S. residents have to pay more dollars to buy Japanese goods. To illustrate, suppose the dollar price of a yen is \$0.012 and that a Toyota is priced at 2 million yen. At this exchange rate, a U.S. resident pays \$24,000 for a Toyota ( $\$0.012 \times 2 \text{ million yen} = \$24,000$ ). If the dollar depreciates to \$0.018 to one yen, then the U.S. resident will have to pay \$36,000 for a Toyota.

As the dollar depreciates, the prices of Japanese goods rise for U.S. residents, so they buy fewer Japanese goods—thus, U.S. imports decline. At the same time, as the dollar depreciates relative to the yen, the yen appreciates relative to the dollar. This means prices of U.S. goods fall for the Japanese, so they buy more U.S. goods—and U.S. exports rise.

Currency markets operate under a system called floating exchange rates. Prices of currencies "float" up and down based upon the demand for and supply of each currency. Global currency traders create the supply of and demand for a particular currency based on that currency's investment, trade potential, and economic strength. If a country decides that its currency is not properly valued in international currency markets, the government may step in and adjust the currency's value. In a devaluation, a nation lowers the value of its currency relative to other currencies. This makes that country's exports cheaper and should, in turn, help the balance of payments.

In other cases, a country's currency may be undervalued, giving its exports an unfair competitive advantage. Many people believe that China's huge trade surplus with the United States is partially because China's currency was undervalued. In 2017, the U.S. Department of Commerce issued a fact sheet detailing how it accused China of dumping steel on the U.S. market as well as providing financial assistance to Chinese companies to produce, manufacture, and export stainless steel to the United States from the People's Republic of China.

"Fact Sheet: Commerce Finds Dumping and Countervailable Subsidies of Imports of Stainless Steel Sheet and Strip from the People's Republic of China," <http://enforcement.trade.gov>, accessed June 26, 2017.

1. What is global vision, and why is it important?
2. What impact does international trade have on the U.S. economy?
3. Explain the impact of a currency devaluation.

## Summary of Learning Outcomes

### 1. Why is global trade important to the United States, and how is it measured?

International trade improves relations with friends and allies, eases tensions among nations, helps bolster economies, raises people's standard of living, and improves the quality of life. The United States is still the largest importer and exporter in the world. We export a fifth of our industrial production and about a third of our farm crops.

Two concepts important to global trade are the balance of trade (the difference in value between a country's exports and its imports over some period) and the balance of payments (the difference between a country's total payments to other countries and its total receipts from other countries). The United States now has both a negative balance of trade and a negative balance of payments. Another important concept is the exchange rate, which is the price of one country's currency in terms of another country's currency. Currencies float up and down based upon the supply of and demand for each currency. Sometimes a government steps in and devalues its currency relative to the currencies of other countries.

## Glossary

### **balance of payments**

A summary of a country's international financial transactions showing the difference between the country's total payments to and its total receipts from other countries.

### **balance of trade**

The difference between the value of a country's exports and the value of its imports during a specific time.

### **devaluation**

A lowering of the value of a nation's currency relative to other currencies.

### **exports**

Goods and services produced in one country and sold to other countries.

### **floating exchange rates**

A system in which prices of currencies move up and down based upon the demand for and supply of the various currencies.

### **global vision**

The ability to recognize and react to international business opportunities, be aware of threats from foreign competition, and effectively use international distribution networks to obtain raw materials and move finished products to customers.

### **imports**

Goods and services that are bought from other countries.

### **trade deficit**

An unfavorable balance of trade that occurs when a country imports more than it exports.

### **trade surplus**

A favorable balance of trade that occurs when a country exports more than it imports.



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# 26. Why Nations Trade

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## 2. Why do nations trade?

One might argue that the best way to protect workers and the domestic economy is to stop trade with other nations. Then the whole circular flow of inputs and outputs would stay within our borders. But if we decided to do that, how would we get resources like cobalt and coffee beans? The United States simply can't produce some things, and it can't manufacture some products, such as steel and most clothing, at the low costs we're used to. The fact is that nations—like people—are good at producing different things: you may be better at balancing a ledger than repairing a car. In that case you benefit by “exporting” your bookkeeping services and “importing” the car repairs you need from a good mechanic. Economists refer to specialization like this as *advantage*.

## Absolute Advantage

A country has an absolute advantage when it can produce and sell a product at a lower cost than any other country or when it is the only country that can provide a product. The United States, for example, has an absolute advantage in reusable spacecraft and other high-tech items.

Suppose that the United States has an absolute advantage in air traffic control systems for busy airports and that Brazil has an absolute advantage in coffee. The United States does not have the proper climate for growing coffee, and Brazil lacks the technology to develop air traffic control systems. Both countries would gain by exchanging air traffic control systems for coffee.

## Comparative Advantage

Even if the United States had an absolute advantage in both coffee and air traffic control systems, it should still specialize and engage in trade. Why? The reason is the principle of comparative advantage, which says that each country should specialize in the products that it can produce most readily and cheaply and trade those products for goods that foreign countries can produce most readily and cheaply. This specialization ensures greater product availability and lower prices.

For example, India and Vietnam have a comparative advantage in producing clothing because of lower labor costs. Japan has long held a comparative advantage in consumer electronics because of technological expertise. The United States has an advantage in computer software, airplanes, some agricultural products, heavy machinery, and jet engines.

Thus, comparative advantage acts as a stimulus to trade. When nations allow their citizens to trade whatever goods and services they choose without government regulation, free trade exists. Free trade is the policy of permitting the people and businesses of a country to buy and sell where they please without restrictions. The opposite of free trade is protectionism, in which a nation protects its home industries from outside competition by establishing artificial barriers such as tariffs and quotas. In the next section, we'll look at the various barriers, some natural and some created by governments, that restrict free trade.

## The Fear of Trade and Globalization

The continued protests during meetings of the World Trade Organization and the protests during the convocations of the World Bank and the International Monetary Fund (the three organizations are discussed later in the chapter) show that many people fear world trade and globalization. What do they fear? The negatives of global trade are as follows:

- Millions of Americans have lost jobs due to imports or production shifting abroad. Most find new jobs, but often those jobs pay less.
- Millions of others fear losing their jobs, especially at those companies operating under competitive pressure.
- Employers often threaten to export jobs if workers do not accept pay cuts.
- Service and white-collar jobs are increasingly vulnerable to operations moving offshore.

Sending domestic jobs to another country is called outsourcing, a topic you can explore in more depth. Many U.S. companies, such as Dell, IBM, and AT&T, have set up call service centers in India, the Philippines, and other countries. Now even engineering and research and development jobs are being outsourced. Outsourcing and “American jobs” were a big part of the 2016 presidential election with Carrier’s plan to close a plant in Indianapolis and open a new plant in Mexico. While intervention by President Trump did lead to 800 jobs remaining in Indianapolis, Carrier informed the state of Indiana that it will cut 632 workers from its Indianapolis factory. The manufacturing jobs will move to Monterrey, Mexico, where the minimum wage is \$3.90 per day. (Danielle Paquette, “Trump Said He Would Save Jobs at Carrier. The Layoffs Start July 20,” *The Washington Post*, <https://www.washingtonpost.com>, May 24, 2017.)



Anti-globalization groups oppose America's free-trade stance, arguing that corporate interests are hurting the U.S. economy and usurping the power of the American people. The recent protests at the G20 meetings in Hamburg, Germany, expressed anti-free-trade sentiment, supporting the idea that multinational corporations wield too much power. Are fears expressed by anti-globalization activists and nationalists justified? (Credit: fiction of reality/ Flickr/ Attribution 2.0 Generic (CC BY 2.0))

So is outsourcing good or bad? If you happen to lose your job, it's obviously bad for you. However, some economists say it leads to cheaper goods and services for U.S. consumers because costs are lower. Also, it should stimulate exports to fast-growing countries. No one knows how many jobs will be lost to outsourcing in coming years. According to estimates, almost 2.4 million U.S. jobs were outsourced in 2015.

“Jobs Overseas Statistics,” <http://www.statisticbrain.com>, accessed June 26, 2017.

## Benefits of Globalization

A closer look reveals that globalization has been the engine that creates jobs and wealth. Benefits of global trade include the following:

- Productivity grows more quickly when countries produce goods and services in which they have a comparative advantage. Living standards can increase faster. One problem is that big G20 countries have added more than 1,200 restrictive export and import measures since 2008.
- Global competition and cheap imports keep prices down, so inflation is less likely to stop economic growth. However, in some cases this is not working because countries manipulate their currency to get a price advantage.
- An open economy spurs innovation with fresh ideas from abroad.
- Through infusion of foreign capital and technology, global trade provides poor countries with the chance to develop economically by spreading prosperity.
- More information is shared between two trading partners that may not have much in common initially, including insight into local cultures and customs, which may help the two nations expand their collective knowledge and learn ways to compete globally.

Mike Collins, "The Pros and Cons of Globalization," *Forbes*, <https://www.forbes.com>, May 6, 2015.

1. Describe the policy of free trade and its relationship to comparative advantage.
2. Why do people fear globalization?
3. What are the benefits of globalization?

## Summary of Learning Outcomes

2. Why do nations trade?

Nations trade because they gain by doing so. The principle of comparative advantage states that each country should specialize in the goods it can produce most readily and cheaply and trade them for those that other countries can produce most readily and cheaply. The result is more goods at lower prices than if each country produced by itself everything it needed. Free trade allows trade among nations without government restrictions.

### Glossary

**absolute advantage**

The situation when a country can produce and sell a product at a lower cost than any other country or when it is the only country that can provide the product.

**free trade**

The policy of permitting the people and businesses of a country to buy and sell where they please

without restrictions.

**G20**

Informal group that brings together 19 countries and the European Union—the 20 leading economies in the world.

**outsourcing**

Sending work functions to another country, resulting in domestic workers losing their jobs.

**principle of comparative advantage**

The concept that each country should specialize in the products that it can produce most readily and cheaply and trade those products for those that other countries can produce more readily and cheaply.

**protectionism**

The policy of protecting home industries from outside competition by establishing artificial barriers such as tariffs and quotas.

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# 27. Barriers to Trade

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## 3. What are the barriers to international trade?

International trade is carried out by both businesses and governments—as long as no one puts up trade barriers. In general, trade barriers keep firms from selling to one another in foreign markets. The major obstacles to international trade are natural barriers, tariff barriers, and non-tariff barriers.

## Natural Barriers

Natural barriers to trade can be either physical or cultural. For instance, even though raising beef in the relative warmth of Argentina may cost less than raising beef in the bitter cold of Siberia, the cost of shipping the beef from South America to Siberia might drive the price too high. *Distance* is thus one of the natural barriers to international trade.

Language is another natural trade barrier. People who can't communicate effectively may not be able to negotiate trade agreements or may ship the wrong goods.

## Tariff Barriers

A tariff is a tax imposed by a nation on imported goods. It may be a charge per unit, such as per barrel of oil or per new car; it may be a percentage of the value of the goods, such as 5 percent of a \$500,000 shipment of shoes; or it may be a combination. No matter how it is assessed, any tariff makes imported goods more costly, so they are less able to compete with domestic products.

Protective tariffs make imported products less attractive to buyers than domestic products. The United States, for instance, has protective tariffs on imported poultry, textiles, sugar, and some types of steel and clothing, and in March of 2018 the Trump administration added tariffs on steel and aluminum from most countries. On the other side of the world, Japan imposes a tariff on U.S. cigarettes that makes them cost 60 percent more than Japanese brands. U.S. tobacco firms believe they could get as much as a third of the Japanese market if there were no tariffs on cigarettes. With tariffs, they have under 2 percent of the market.

## *Arguments for and against Tariffs*

Congress has debated the issue of tariffs since 1789. The main arguments for tariffs include the following:

- Tariffs protect infant industries. A tariff can give a struggling new domestic industry time to become an effective global competitor.
- Tariffs protect U.S. jobs. Unions and others say tariffs keep foreign labor from taking away U.S. jobs.
- Tariffs aid in military preparedness. Tariffs should protect industries and technology during peacetime that are vital to the military in the event of war.

The main arguments *against* tariffs include the following:



- Tariffs discourage free trade, and free trade lets the principle of competitive advantage work most efficiently.
- Tariffs raise prices, thereby decreasing consumers' purchasing power. In 2017, the United States imposed tariffs of 63.86 percent to 190.71 percent on a wide variety of Chinese steel products. The idea was to give U.S. steel manufacturers a fair market after the Department of Commerce concluded their antidumping and anti-subsidy probes. It is still too early to determine what the effects of these tariffs will be, but higher steel prices are likely. Heavy users of steel, such as construction and automobile industries, will see big increases in their production costs. It is also likely that China may impose tariffs on certain U.S. products and services and that any negotiations on intellectual property and piracy will bog down.

Wendy Wu, "China Upset at High U.S. Tariffs on Steel Imports," *South China Morning Post*, <http://www.scmp.com>, February 4, 2017.

## Nontariff Barriers

Governments also use other tools besides tariffs to restrict trade. One type of nontariff barrier is the import quota, or limits on the quantity of a certain good that can be imported. The goal of setting quotas is to limit imports to the specific amount of a given product. The United States protects its shrinking textile industry with quotas. A complete list of the commodities and products subject to import quotas is available on line at the U.S. Customs and Border Protection Agency website.

"Commodities Subject to Import Quotas," <https://www.cbp.gov>, accessed June 25, 2017.

A complete ban against importing or exporting a product is an embargo. Often embargoes are set up for defense purposes. For instance, the United States does not allow various high-tech products, such as supercomputers and lasers, to be exported to countries that are not allies. Although this embargo costs U.S. firms billions of dollars each year in lost sales, it keeps enemies from using the latest technology in their military hardware.

Government rules that give special privileges to domestic manufacturers and retailers are called buy-national regulations. One such regulation in the United States bans the use of foreign steel in constructing U.S. highways. Many state governments have buy-national rules for supplies and services. In a more subtle move, a country may make it hard for foreign products to enter its markets by establishing customs regulations that are different from generally accepted international standards, such as requiring bottles to be quart size rather than liter size.

Exchange controls are laws that require a company earning foreign exchange (foreign currency) from its exports to sell the foreign exchange to a control agency, usually a central bank. For example, assume that Rolex, a Swiss company, sells 300 watches to Zales Jewelers, a U.S. chain, for US\$600,000. If Switzerland had exchange controls, Rolex would have to sell its U.S. dollars to the Swiss central bank and would receive Swiss francs. If Rolex wants to buy goods (supplies to make watches) from abroad, it must go to the central bank and buy foreign exchange (currency). By controlling the amount of foreign exchange sold to companies, the government controls the amount of products that can be imported. Limiting imports and encouraging exports helps a government to create a favorable balance of trade.

1. Discuss the concept of natural trade barriers.
2. Describe several tariff and non-tariff barriers to trade.

## Summary of Learning Outcomes

3. What are the barriers to international trade?

The three major barriers to international trade are natural barriers, such as distance and language; tariff barriers, or taxes on imported goods; and non-tariff barriers. The non-tariff barriers to trade include import quotas, embargoes, buy-national regulations, and exchange controls. The main argument against tariffs is that they discourage free trade and keep the principle of comparative advantage from working efficiently. The main argument for using tariffs is that they help protect domestic companies, industries, and workers.

## Glossary

**buy-national regulations**

Government rules that give special privileges to domestic manufacturers and retailers.

**embargo**

A total ban on imports or exports of a product.

**exchange controls**

Laws that require a company earning foreign exchange (foreign currency) from its exports to sell the foreign exchange to a control agency, such as a central bank.

**import quota**

A limit on the quantity of a certain good that can be imported.

**protective tariffs**

Tariffs that are imposed in order to make imports less attractive to buyers than domestic products are.

**tariff**

A tax imposed on imported goods.

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## 28. Fostering Global Trade

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### 4. How do governments and institutions foster world trade?

#### Anti-dumping Laws

U.S. firms don't always get to compete on an equal basis with foreign firms in international trade. To level the playing field, Congress has passed anti-dumping laws. Dumping is the practice of charging a lower price for a product (perhaps below cost) in foreign markets than in the firm's home market. The company might be trying to win foreign customers, or it might be seeking to get rid of surplus goods.

When the variation in price can't be explained by differences in the cost of serving the two markets, dumping is suspected. Most industrialized countries have anti-dumping regulations. They are especially concerned about *predatory dumping*, the attempt to gain control of a foreign market by destroying competitors with impossibly low prices.

The United States recently imposed tariffs on softwood lumber from Canada. Canada was found guilty of pricing softwood lumber at between 7.72 and 4.49 percent below their costs. U.S. customs officers will now levy tariffs on Canadian timber exports with tax rates from 17.41 percent to 30.88 percent, depending on the business.

"Members and Observers," <https://www.wto.org>, accessed June 25, 2017.

From our discussion so far, it might seem that governments act only to restrain global trade. On the contrary, governments and international financial organizations work hard to increase it, as this section explains.

#### Trade Negotiations and the World Trade Organization

The Uruguay Round of trade negotiations is an agreement that dramatically lowers trade barriers worldwide. Adopted in 1994, the agreement has been now signed by 148 nations. The most ambitious global trade agreement ever negotiated, the Uruguay Round reduced tariffs by one-third worldwide, a move that is expected to increase global income by \$235 billion annually. Perhaps the most notable aspect of the agreement is its recognition of new global realities. For the first time, an agreement covers services, intellectual property rights, and trade-related investment measures such as exchange controls.

As a follow-up to the Uruguay Round, a negotiating round started in the capital of Qatar in 2001 is called the Doha Round. To date, the round has shown little progress in advancing free trade. Developing nations are pushing for the reduction of farm subsidies in the United States, Europe, and Japan. Poor countries say that the subsidies stimulate overproduction, which drives down global agricultural prices. Because developing nations' primary exports are agricultural commodities, low prices mean that they cannot compete in the global marketplace. On the other hand, the United States and Europe are interested in bringing down trade barriers in services and manufacturing. The continuing talks have served as a lightning rod for protesters, who claim that the World Trade Organization (WTO) serves the interests of multinational corporations, promotes trade over preserving the environment, and treats poor nations unfairly.

[https://www.wto.org/english/tratop\\_e/dda\\_e/dda\\_e.htm](https://www.wto.org/english/tratop_e/dda_e/dda_e.htm), accessed June 25, 2017.

The World Trade Organization replaces the old General Agreement on Tariffs and Trade (GATT), which was created in 1948. The GATT contained extensive loopholes that enabled countries to evade agreements to reduce trade barriers.

Today, all WTO members must fully comply with all agreements under the Uruguay Round. The WTO also has an effective dispute settlement procedure with strict time limits to resolve disputes.

The WTO has emerged as the world's most powerful institution for reducing trade barriers and opening markets. The advantage of WTO membership is that member countries lower trade barriers among themselves. Countries that don't belong must negotiate trade agreements individually with all their trading partners. Only a few countries, such as North Korea, Turkmenistan, and Eritrea, are not members of the WTO.

“WTO Technical Notes,” [https://www.wto.org/english/res\\_e/booksp\\_e/anrep\\_e/wtr10\\_tech\\_notes\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/anrep_e/wtr10_tech_notes_e.pdf), accessed July 17, 2017.



Headquartered in Toulouse, France, Airbus is one of the world's top commercial aircraft manufacturers, operating design and manufacturing facilities in Europe, Japan, China, and the United States. The airliner's current product lineup of 12 jet-aircraft types ranging from 100 seats to 600 seats is heavy competition for Boeing, a top U.S. airline firm with which Airbus has ongoing subsidy-related disputes. What is the World Trade Organization's role in settling disputes between competing multinational corporations? (Credit: Bartłomiej Mostek/ Flickr/ Attribution 2.0 Generic (CC BY 2.0))

The United States has had mixed results in bringing disputes before the WTO. To date, it has won slightly fewer than half of the cases it has presented to the WTO. America has also won about one-third of the cases brought against it by other countries. One of America's recent losses came in a ruling where the U.S. claimed that tuna imported from Mexico was not meeting the “dolphin safe” criteria, meaning that dolphins were not being killed during the process to catching tuna. The WTO ruled in favor of Mexico. Recently, the United States targeted Europe, India, South Korea, Canada, and Argentina to file cases against. The disputes ranged from European aviation practices to Indian trade barriers affecting U.S. automakers.

One of the biggest disputes before the WTO involved the United States and the European Union. The United States claims that Europe has given Airbus \$15 billion in aid to develop airplanes. The European Union claims that the U.S. government has provided \$23 billion in military research that has benefited Boeing's commercial aircraft business. It also claimed that Washington State (the home of Boeing manufacturing) has given the company \$3.2 billion in unfair tax breaks.

“EC and Certain Member States—Large Civil Aircraft,” <https://www.wto.org>, accessed June 25, 2017.

## The World Bank and International Monetary Fund

Two international financial organizations are instrumental in fostering global trade. The World Bank offers low-interest loans to developing nations. Originally, the purpose of the loans was to help these nations build infrastructure such as roads, power plants, schools, drainage projects, and hospitals. Now the World Bank offers loans to help developing nations relieve their debt burdens. To receive the loans, countries must pledge to lower trade barriers and aid private enterprise. In addition to making loans, the World Bank is a major source of advice and information for developing nations. The United States has granted the organization millions to create knowledge databases on nutrition, birth control, software engineering, creating quality products, and basic accounting systems.

The International Monetary Fund (IMF) was founded in 1945, one year after the creation of the World Bank, to promote trade through financial cooperation and eliminate trade barriers in the process. The IMF makes short-term loans to member nations that are unable to meet their budgetary expenses. It operates as a lender of last resort for troubled nations. In exchange for these emergency loans, IMF lenders frequently extract significant commitments from the borrowing nations to address the problems that led to the crises. These steps may include curtailing imports or even devaluing the currency.

Some global financial problems do not have a simple solution. One option would be to pump a lot more funds into the IMF, giving it enough resources to bail out troubled countries and put them back on their feet. In effect, the IMF would be turned into a real lender of last resort for the world economy.

The danger of counting on the IMF, though, is the “moral hazard” problem. Investors would assume that the IMF would bail them out and would therefore be encouraged to take bigger and bigger risks in emerging markets, leading to the possibility of even deeper financial crises in the future.

1. Describe the purpose and role of the WTO.
2. What are the roles of the World Bank and the IMF in world trade?

## Summary of Learning Outcomes

4. How do governments and institutions foster world trade?

The World Trade Organization, established by the Uruguay Round of trade negotiations, has dramatically lowered trade barriers worldwide. For the first time, a trade agreement covers services, intellectual property rights, and exchange controls. The World Bank makes loans to developing nations to help build infrastructures. The International Monetary Fund makes loans to member nations that cannot meet their budgetary expenses. Despite efforts to expand trade, terrorism can have a negative impact on trade growth.

### Glossary

**dumping**

The practice of charging a lower price for a product in foreign markets than in the firm's home market.

**International Monetary Fund (IMF)**

An international organization, founded in 1945, that promotes trade, makes short-term loans to member nations, and acts as a lender of last resort for troubled nations.

**Uruguay Round**

A 1994 agreement originally signed by 117 nations to lower trade barriers worldwide.

**World Bank**

An international bank that offers low-interest loans, as well as advice and information, to developing nations.

**World Trade Organization (WTO)**

An organization established by the Uruguay Round in 1994 to oversee international trade, reduce trade barriers, and resolve disputes among member nations.

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## 29. International Economic Communities

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### 5. What are international economic communities?

Nations that frequently trade with each other may decide to formalize their relationship. The governments meet and work out agreements for a common economic policy. The result is an economic community or, in other cases, a bilateral trade agreement (an agreement between two countries to lower trade barriers). For example, two nations may agree upon a preferential tariff, which gives advantages to one nation (or several nations) over others. When members of the British Commonwealth (countries that are former British territories) trade with Great Britain, they pay lower tariffs than do other nations. For example, Canada and Australia are former British territories but still members of the British Commonwealth. You will note that Queen Elizabeth still appears on Canadian currency and the Union Jack is still incorporated into the Australian flag. In other cases, nations may form free-trade associations. In a free-trade zone, few duties or rules restrict trade among the partners, but nations outside the zone must pay the tariffs set by the individual members.

### North American Free Trade Agreement (NAFTA)

The North American Free Trade Agreement (NAFTA) created the world's largest free-trade zone. The agreement was ratified by the U.S. Congress in 1993. It includes Canada, the United States, and Mexico, with a combined population of 450 million and an economy of over \$20.8 trillion.

"Facts about NAFTA: Statistics and Accomplishments," <https://www.thebalance.com/facts-about-nafta-statistics-and-accomplishments-3306280>, July 7, 2017.

Canada, one of the largest U.S. trading partners, entered a free-trade agreement with the United States in 1988. Thus, most of the new long-run opportunities opened for U.S. business under NAFTA are in Mexico, America's third-largest trading partner. Before NAFTA, tariffs on Mexican exports to the United States averaged just 4 percent, and most goods entered the United States duty-free, so NAFTA's primary impact was to open the Mexican market to U.S. companies. When the treaty went into effect, tariffs on about half the items traded across the Rio Grande disappeared. Since NAFTA came into effect, U.S.-Mexican trade has increased from \$80 billion to \$515 billion annually. The pact removed a web of Mexican licensing requirements, quotas, and tariffs that limited transactions in U.S. goods and services. For instance, the pact allows U.S. and Canadian financial-services companies to own subsidiaries in Mexico for the first time in 50 years.





The softwood lumber dispute between the United States and Canada that has resulted in the U.S. imposing tariffs on Canadian softwood lumber imports is one of the longest trade disputes between the two nations. The dispute is the result of disagreements about Canadian lumber production and imports between the two nations. The main contention in the softwood lumber dispute is the U.S. claim that the Canadian government is unfairly subsidizing Canadian lumber production by providing access to public land while U.S. producers harvest softwood lumber on their own property. Why do anti-free-trade groups support these tariffs when the result will be higher prices for softwood lumber? (Credit: Jesse Wagstaff/ Flickr/ Attribution-NoDerivs 2.0 Generic (CC BY 2.0))

The real test of NAFTA will be whether it can deliver rising prosperity on both sides of the Rio Grande. For Mexicans, NAFTA must provide rising wages, better benefits, and an expanding middle class with enough purchasing power to keep buying goods from the United States and Canada. That scenario seems to be working. At the DelphiCorp. auto parts plant in Ciudad Juárez, just across the border from El Paso, Texas, the assembly line is a cross section of working-class Mexico. In the years since NAFTA lowered trade and investment barriers, Delphi has significantly expanded its presence in the country. Today it employs 70,000 Mexicans, who every day receive up to 70 million U.S.-made components to assemble into parts. The wages are modest by U.S. standards—an assembly-line worker with two years' experience earns about \$2.30 an hour. But that's triple Mexico's minimum wage, and Delphi jobs are among the most coveted in Juárez. The United States recently notified the Canadian and Mexican governments that it intends to renegotiate aspects of the NAFTA agreement.

"Mexico Nominal Hourly Wages in Manufacturing," <https://tradingeconomics.com>, accessed June 25, 2017; Julie Hirschfeld Davis, "Trump Sends NAFTA Renegotiation Notice to Congress," *The New York Times*, <http://www.nytimes.com>, May 18, 2017; Kate Linthicum, "What Happened When Factory Jobs Moved from Warren, Ohio, to Juarez, Mexico," *Los Angeles Times*, <http://www.latimes.com>, February 17, 2017.

The largest new trade agreement is Mercosur, which includes Peru, Brazil, Argentina, Uruguay, and Paraguay. The elimination of most tariffs among the trading partners has resulted in trade revenues that currently exceed \$16 billion annually. Recent recessions in Mercosur countries have limited economic growth, even though trade among Mercosur countries has continued to grow.



## Central America Free Trade Agreement

The newest free trade agreement is the Central America Free Trade Agreement (CAFTA) passed in 2005. Besides the United States, the agreement includes Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua. The United States is already the principal exporter to these nations, so economists don't think that it will result in a major increase in U.S. exports. It will, however, reduce tariffs on exports to CAFTA countries. Already, some 80 percent of the goods imported into the United States from CAFTA nations are tariff-free. CAFTA countries may benefit from the new permanent trade deal if U.S. multinational firms deepen their investment in the region.

## The European Union

In 1993, the member countries of the European Community (EC) ratified the Maastricht Treaty, which proposed to take the EC further toward economic, monetary, and political union. Although the heart of the treaty deals with developing a unified European Market, Maastricht was also intended to increase integration among European Union (EU) members.

The EU has helped increase this integration by creating a borderless economy for the 28 European nations, shown on the map in **(Figure)**.

[https://ec.europa.eu/info/policies/eu-enlargement\\_en#bootstrap-fieldgroup-nav-item-details-2](https://ec.europa.eu/info/policies/eu-enlargement_en#bootstrap-fieldgroup-nav-item-details-2), June 25, 2017.

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### EU28 Member States: Candidate Countries:

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>• Austria</li><li>• Belgium</li><li>• Bulgaria</li><li>• Croatia</li><li>• Cyprus</li><li>• Czech Republic</li><li>• Denmark</li><li>• Estonia</li><li>• Finland</li><li>• France</li><li>• Germany</li><li>• Greece</li><li>• Hungary</li><li>• Ireland</li><li>• Italy</li><li>• Latvia</li><li>• Lithuania</li><li>• Luxembourg</li><li>• Malta</li><li>• The Netherlands</li><li>• Poland</li><li>• Portugal</li><li>• Romania</li><li>• Slovakia</li><li>• Slovenia</li><li>• Spain</li><li>• Sweden</li><li>• United Kingdom</li></ul> | <ul style="list-style-type: none"><li>• Albania</li><li>• Former Yugoslav Republic of Macedonia</li><li>• Montenegro</li><li>• Serbia</li><li>• Turkey</li></ul> |
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European Union member states have set up common institutions to which they delegate some of their sovereignty so that decisions on specific matters of joint interest can be made democratically at the European level. This pooling of sovereignty is also called European integration. In 2016, citizens of the United Kingdom voted to leave the European Union, a plan known as Brexit, which could take several years to occur. "Brexit: All You Need to Know About the UK Leaving the EU," BBC,( June 26, 2017), <http://www.bbc.com/news/uk-politics-32810887>, June 26, 2017.



Source: Adapted from [https://europa.eu/european-union/about-eu/countries/member-countries\\_en](https://europa.eu/european-union/about-eu/countries/member-countries_en).

One of the principal objectives of the European Union is to promote economic progress of all member countries. The EU has stimulated economic progress by eliminating trade barriers, differences in tax laws, and differences in product standards, and by establishing a common currency. A new European Community Bank was created, along with a common currency called the euro. The European Union's single market has created 2.5 million new jobs since it was founded and generated more than \$1 trillion in new wealth.

"Is Europe Outperforming the US?" *World Economic Forum*, <https://www.weforum.org/agenda/2015/10/is-europe-outperforming-the-us/>, October 30, 2015.

The opening of national EU markets has brought down the price of national telephone calls by 50 percent since 1998. Under pressure of competition, the prices of fares in Europe have fallen significantly. The removal of national restrictions has enabled more than 15 million Europeans to go to another EU country to work or spend their retirement.

The EU is a very tough antitrust enforcer; some would say it is tougher than the United States. The EU, for example, fined Google \$2.7 billion for favoring some of its own services in its search results.

Mark Scott, "Google Fined \$2.7 Billion in E.U. Antitrust Case," *The New York Times*, <http://www.nytimes.com>, June 26, 2017.

Unlike in the United States, the EU can seal off corporate offices for unspecified periods to prevent destruction of

evidence and enter the homes, cars, yachts, and other personal property of executives suspected of abusing their companies' market power or conspiring to fix prices.

Microsoft has been fighting the European Court since 2002, with no quick end in sight. The Court fined Microsoft for monopolizing internet access by offering Internet Explorer with its Windows software. The company is also appealing a Court decision requiring it to share code with "open source" companies. Another big U.S. company, Coca-Cola, settled a six-year antitrust dispute with the European Court by agreeing to strict limits on its sales tactics. Coke can't sign exclusive agreements with retailers that would ban competing soft drinks or give retailers rebates based on sales volume. Furthermore, it must give rivals, like Pepsi, 20 percent of the space in Coke coolers so Pepsi can stock its own brands. If Coke violates the terms of the agreement, it will be fined 10 percent of its worldwide revenue (over \$2 billion). "EU Makes Coke Throw Open Fridges," BBC, <http://news.bbc.co.uk>, June 22, 2005.

An entirely different type of problem facing global businesses is the possibility of a protectionist movement by the EU against outsiders. For example, European automakers have proposed holding Japanese imports at roughly their current 10 percent market share. The Irish, Danes, and Dutch don't make cars and have unrestricted home markets; they are unhappy at the prospect of limited imports of Toyotas and Hondas. Meanwhile, France has a strict quota on Japanese cars to protect its own Renault and Peugeot. These local automakers could be hurt if the quota is raised at all.

Interestingly, a number of big U.S. companies are already considered more "European" than many European companies. Coke and Kellogg's are considered classic European brand names. Ford and General Motors compete for the largest share of auto sales on the continent. Apple, IBM, and Dell dominate their markets. General Electric, AT&T, and Westinghouse are already strong all over Europe and have invested heavily in new manufacturing facilities there.

The European Union proposed a constitution that would centralize powers at the Union level and decrease the powers of individual member countries. It also would create a single voice in world affairs by creating a post of foreign minister. The constitution also gave the EU control over political asylum, immigration, guaranteed freedom of speech, and collective labor bargaining. In order to become law, each EU country had to ratify the constitution. The two most powerful countries in the EU, France and Germany, voted "no" in the summer of 2005. Citizens of both countries were afraid that the constitution would draw jobs away from Western Europe and to the Eastern European EU countries. These new members of the EU have lower wage rates and fewer regulations. Voters were also worried that the constitution would result in free-market reforms along American or British lines over France and Germany's traditional social protections. Concerns over immigration also sparked the referendum vote that is leading to the United Kingdom leaving the European Union.

1. Explain the pros and cons of NAFTA.
2. What is the European Union? Will it ever be a United States of Europe?

## Summary of Learning Outcomes

5. What are international economic communities?

International economic communities reduce trade barriers among themselves while often establishing common tariffs and other trade barriers toward nonmember countries. The best-known economic communities are the European Union, NAFTA, CAFTA, and Mercosur.

## Glossary

**European integration**

The delegation of limited sovereignty by European Union member states to the EU so that common laws and policies can be created at the European level.

**European Union**

Trade agreement among 28 European nations.

**free-trade zone**

An area where the nations allow free, or almost free, trade among each other while imposing tariffs on goods of nations outside the zone.

**Mercosur**

Trade agreement between Peru, Brazil, Argentina, Uruguay, and Paraguay.

**North American Free Trade Agreement (NAFTA)**

A 1993 agreement creating a free-trade zone including Canada, Mexico, and the United States.

**preferential tariff**

A tariff that is lower for some nations than for others.

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# 30. Participating in the Global Marketplace

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## 6. How do companies enter the global marketplace?

Companies decide to “go global” for a number of reasons. Perhaps the most urgent reason is to earn additional profits. If a firm has a unique product or technological advantage not available to other international competitors, this advantage should result in major business successes abroad. In other situations, management may have exclusive market information about foreign customers, marketplaces, or market situations. In this case, although exclusivity can provide an initial motivation for going global, managers must realize that competitors will eventually catch up. Finally, saturated domestic markets, excess capacity, and potential for cost savings can also be motivators to expand into international markets. A company can enter global trade in several ways, as this section describes.

## Exporting

When a company decides to enter the global market, usually the least complicated and least risky alternative is exporting, or selling domestically produced products to buyers in another country. A company, for example, can sell directly to foreign importers or buyers. Exporting is not limited to huge corporations such as General Motors or Apple. Indeed, small companies typically enter the global marketplace by exporting. China is the world’s largest exporter, followed by the United States.

<https://www.cia.gov/library/publications/the-world-factbook/rankorder/2078rank.html>, accessed June 25, 2017.

Many small businesses claim that they lack the money, time, or knowledge of foreign markets that exporting requires. The U.S. Small Business Administration (SBA) now offers the Export Working Capital Program, which helps small and medium-size firms obtain working capital (money) to complete export sales. The SBA also provides counseling and legal assistance for small businesses that wish to enter the global marketplace. Companies such as American Building Restoration Products of Franklin, Wisconsin, have benefited tremendously from becoming exporters. American Building is now selling its chemical products to building restoration companies in Mexico, Israel, Japan, and Korea. Exports account for more than 5 percent of the firm’s total sales.

Plenty of governmental help is available when a company decides to begin exporting. Export Assistance Centers (EAC) provide a one-stop resource for help in exporting. Over 700 EACs are placed strategically around the country. Often the SBA is located in the same building as the EAC. The SBA can guarantee loans of \$50,000 to \$100,000 to help an exporter grow its business. Online help is also available at <http://www.ustr.gov>. The site lists international trade events, offers international marketing research, and has practical tools to help with every step of the exporting process. Companies considering exporting for the first time can go to <http://www.export.gov> and get answers to questions such as: What’s in it for me? Am I ready for this? What do I have to do? The site also provides a huge list of resources for the first-time exporter.

## Licensing and Franchising

Another effective way for a firm to move into the global arena with relatively little risk is to sell a license to manufacture its product to a firm in a foreign country. Licensing is the legal process whereby a firm (the *licensor*) agrees to let another

firm (the *licensee*) use a manufacturing process, trademark, patent, trade secret, or other proprietary knowledge. The licensee, in turn, agrees to pay the licensor a royalty or fee agreed on by both parties.

International licensing is a multibillion-dollar-a-year industry. Entertainment and character licensing, such as DVD movies and characters such as Batman, is the largest single category. Trademarks are the second-largest source of licensing revenue. Caterpillar licenses its brand for both shoes and clothing, which is very popular in Europe.

U.S. companies have eagerly embraced the licensing concept. For instance, Labatt Brewing Company has a license to produce Miller High Life in Canada. The Spalding Company receives more than \$2 million annually from license agreements on its sporting goods. Fruit of the Loom lends its name through licensing to 45 consumer items in Japan alone, for at least 1 percent of the licensee's gross sales.

The licensor must make sure it can exercise sufficient control over the licensee's activities to ensure proper quality, pricing, distribution, and so on. Licensing may also create a new competitor in the long run if the licensee decides to void the license agreement. International law is often ineffective in stopping such actions. Two common ways that a licensor can maintain effective control over its licensees are by shipping one or more critical components from the United States and by locally registering patents and trademarks in its own name.

*Franchising* is a form of licensing that has grown rapidly in recent years. Many U.S. franchisors operate thousands of outlets in foreign countries. More than half of the international franchises are for fast-food restaurants and business services. McDonald's, however, decided to sell its Chinese stores to a group of outside investors for \$1.8 billion, but retained 20 percent of the equity.

"McDonald's Sells Control of China Business to Citic, Carlyle," *Bloomberg News*, <https://www.bloomberg.com/news/articles/2017-01-09/mcdonald-s-sells-control-of-china-business-to-citic-carlyle>, January 9, 2017.

Having a big-name franchise doesn't always guarantee success or mean that the job will be easy. In China, Home Depot closed its stores after opening 12 to serve the large Chinese population. Had they done market research, they would have known that the majority of urban dwellers live in recently built apartments and that DIY (Do It Yourself) is viewed with disdain in Chinese society, where it is seen as a sign of poverty.

"Famous Failures in China," <http://www.1421.consulting>, February 2, 2016.

When Subway opened its first sandwich shop in China, locals stood outside and watched for a few days. Patrons were so confused that the franchisee had to print signs explaining how to order. Customers didn't believe the tuna salad was made from a fish because they couldn't see the head or tail. And they didn't like the idea of touching their food, so they would hold the sandwich vertically, peel off the paper wrap, and eat it like a banana. Most of all, the Chinese customers didn't want sandwiches.

It's not unusual for Western food chains to adapt their strategies when selling in China. McDonald's, aware that the Chinese consume more chicken than beef, offered a spicy chicken burger. KFC got rid of coleslaw in favor of seasonal dishes such as shredded carrots or bamboo shoots.

## Contract Manufacturing

In contract manufacturing, a foreign firm manufactures private-label goods under a domestic firm's brand. Marketing may be handled by either the domestic company or the foreign manufacturer. Levi Strauss, for instance, entered into an agreement with the French fashion house of Cacharel to produce a new Levi's line, Something New, for distribution in Germany.

The advantage of contract manufacturing is that it lets a company test the water in a foreign country. By allowing the foreign firm to produce a certain volume of products to specification and put the domestic firm's brand name on the goods, the domestic firm can broaden its global marketing base without investing in overseas plants and equipment. After establishing a solid base, the domestic firm may switch to a joint venture or direct investment, explained below.

## Joint Ventures

Joint ventures are somewhat similar to licensing agreements. In a joint venture, the domestic firm buys part of a foreign company or joins with a foreign company to create a new entity. A joint venture is a quick and relatively inexpensive way to enter the global market. It can also be very risky. Many joint ventures fail. Others fall victim to a takeover, in which one partner buys out the other.

Sometimes countries have required local partners in order to establish a business in their country. China, for example, had this requirement in a number of industries until recently. Thus, a joint venture was the only way to enter the market. Joint ventures help reduce risks by sharing costs and technology. Often joint ventures will bring together different strengths from each member. In the General Motors–Suzuki joint venture in Canada, for example, both parties have contributed and gained. The alliance, CAMI Automotive, was formed to manufacture low-end cars for the U.S. market. The plant, which was run by Suzuki management, produces the Chevrolet Equinox and the Pontiac Torrent, as well as the new Suzuki SUV. Through CAMI, Suzuki has gained access to GM's dealer network and an expanded market for parts and components. GM avoided the cost of developing low-end cars and obtained models it needed to revitalize the lower end of its product line and its average fuel economy rating. After the successful joint venture, General Motors gained full control of the operation in 2011. The CAMI factory may be one of the most productive plants in North America. There GM has learned how Japanese automakers use work teams, run flexible assembly lines, and manage quality control. General Motors website, [http://www.gmcamiassembly.ca/Facilities/public/ca/en/CAMI/about\\_us.html](http://www.gmcamiassembly.ca/Facilities/public/ca/en/CAMI/about_us.html), accessed July 17, 2017.

## Direct Foreign Investment

Active ownership of a foreign company or of overseas manufacturing or marketing facilities is direct foreign investment. Direct investors have either a controlling interest or a large minority interest in the firm. Thus, they stand to receive the greatest potential reward but also face the greatest potential risk. A firm may make a direct foreign investment by acquiring an interest in an existing company or by building new facilities. It might do so because it has trouble transferring some resources to a foreign operation or obtaining that resource locally. One important resource is personnel, especially managers. If the local labor market is tight, the firm may buy an entire foreign firm and retain all its employees instead of paying higher salaries than competitors.

Sometimes firms make direct investments because they can find no suitable local partners. Also, direct investments avoid the communication problems and conflicts of interest that can arise with joint ventures. IBM, in the past, insisted on total ownership of its foreign investments because it did not want to share control with local partners.

General Motors has done very well by building a \$4,400 (RMB 29,800) minivan in China that gets 43 miles per gallon in city driving. The Wuling Sunshine has a quarter the horsepower of U.S. minivans, weak acceleration, and a top speed of 81 miles per hour. The seats are only a third of the thickness of seats in Western models, but look plush compared to similar Chinese cars. The minivans have made GM the largest automotive seller in China, and have made China a large profit center for GM.

Wuling Sunshine, <http://media.gm.com/media/cn/en/wuling/vehicles/sunshine/2010.html>, accessed June 27, 2017.

Walmart now has over 6,000 stores located outside the United States. In 2016, international sales were over \$116 billion. About one-third of all new Walmart stores are opened in global markets.

“Walmart 2017 Annual Report,” <http://stock.walmart.com>, accessed June 27, 2017.

Not all of Walmart's global investments have been successful. In Germany, Walmart bought the 21-store Wertkauf hypermarket chain and then 74 unprofitable and often decrepit Interspar stores. Problems in integrating and upgrading the stores resulted in at least \$200 million in losses. Like all other German stores, Walmart stores were

required by law to close at 8 p.m. on weekdays and 4 p.m. on Saturdays, and they could not open at all on Sundays. Costs were astronomical. As a result, Walmart left the German retail market.

Walmart has turned the corner on its international operations. It is pushing operational authority down to country managers in order to respond better to local cultures. Walmart enforces certain core principles such as everyday low prices, but country managers handle their own buying, logistics, building design, and other operational decisions.

Global firms change their strategies as local market conditions evolve. For example, major oil companies like Shell Oil and Exxon Mobil had to react to dramatic changes in the price of oil due to technological advances such as more efficient automobiles, fracking, and horizontal drilling.

#### Managing the Drop in Oil Prices

In 2014, crude oil was \$90 a barrel, but increased production due to the shale oil boom and the reluctance of OPEC countries to reduce output led to a price drop to \$45–\$60 throughout the first quarter of 2015. While this is terrific news for consumers, it does provide challenges to managers at both large and small companies connected to the oil industry. Companies such as Chevron, Royal Dutch Shell, and Exxon Mobil saw dramatic reductions in their earnings, which were also reflected in lower stock prices.

The action taken by senior executives at Chevron was to trim their planned capital expenditures by \$5 billion in 2016, resulting in the elimination of 1,500 jobs, while Exxon Mobil executives Jeff Woodbury and CEO Rex Tillerson (now the former U.S. Secretary of State) were less specific; they planned several belt-tightening strategies and forecast several years of low oil prices. Likewise, Ben van Beurden, the CEO of Royal Dutch Shell, announced plans to eliminate 6,500 jobs and also predicted long-range low prices for oil.

In addition to layoffs, actions that oil company managers can employ include mergers for companies that don't have the ability to become fully efficient themselves. They can merge with other companies that can improve overall efficiencies and operations. Contrary to the cost-cutting plans mentioned earlier, some companies might consider increasing their spending plans. Going against the reduced expenditures trend is Encana, a North American oil producer, which plans to increase its overall spending. Some of the factors that allowed Encana to increase spending was its low debt-to-equity ratio and its growth, which exceeded the industry average.

Growth is an important component of a company's strategy, and reactive short-term strategies can often hurt long-term growth. By implementing performance-improvement programs, companies can address problems and inefficiencies within the company and allow them to focus on innovation. Another strategy that companies can use is to review and alter their supply chain by focusing on costs and efficiency. Companies can expand their supplier base, thus increasing competition and reducing costs. This also requires companies to embrace a lean manufacturing mindset.

New technology can also be used as a cost driver. New technologies such as microseismic sensors used to monitor fracking operations in drilling operations miles under the earth can boost production. Adopting new technology can also lead to changes in the workers that companies employ. New technology usually requires higher-skilled workers, while reducing the number of lower-skilled workers.

The drop in oil prices has produced a survival-of-the-fittest competition among energy companies. The companies that employ multiple strategies to improve efficiency are the ones that will survive and prosper.

#### Critical Thinking Questions

1. Do you think that Royal Dutch Shell and Exxon Mobil would have been more successful if they had considered strategies other than cutting spending and eliminating jobs? Why or why not?
2. How should oil companies react if oil prices rise to the \$90 to \$100 per barrel level? Explain your reasoning.

Sources: Stanley Reed and Clifford Krauss, "Royal Dutch Shell Profits Continue to Fall, Prompting Layoffs," *The New York Times*, <http://www.nytimes.com>, July 30, 2015; John Biers, "More Belt-tightening Ahead as Exxon, Chevron Profits Dive," *Yahoo! News*, <https://www.yahoo.com>, July 31, 2015; Aisha Tejani, "How Oil Companies Are Responding to the Oil Price Drop," <http://www.castagra.com>, accessed June 30, 2017.



## Countertrade

International trade does not always involve cash. Today, countertrade is a fast-growing way to conduct international business. In countertrade, part or all of the payment for goods or services is in the form of other goods or services. Countertrade is a form of barter (swapping goods for goods), an age-old practice whose origins have been traced back to cave dwellers. The U.S. Commerce Department says that roughly 30 percent of all international trade involves countertrade. Each year, about 300,000 U.S. firms engage in some form of countertrade. U.S. companies, including General Electric, Pepsi, General Motors, and Boeing, barter billions of goods and services every year. Recently, the Malaysian government bought 20 diesel-powered locomotives from China and paid for them with palm oil.

1. Discuss several ways that a company can enter international trade.
2. Explain the concept of countertrade.

## Summary of Learning Outcomes

6. How do companies enter the global marketplace?

There are a number of ways to enter the global market. The major ones are exporting, licensing, contract manufacturing, joint ventures, and direct investment.

### Glossary

**contract manufacturing**

The practice in which a foreign firm manufactures private-label goods under a domestic firm's brand name.

**countertrade**

A form of international trade in which part or all of the payment for goods or services is in the form of other goods and services.

**direct foreign investment**

Active ownership of a foreign company or of manufacturing or marketing facilities in a foreign country.

**exporting**

The practice of selling domestically produced goods to buyers in another country.

**joint venture**

An agreement in which a domestic firm buys part of a foreign firm or joins with a foreign firm to create a new entity.

**licensing**

The legal process whereby a firm agrees to allow another firm to use a manufacturing process, trademark, patent, trade secret, or other proprietary knowledge in exchange for the payment of a royalty.

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# 31. Threats and Opportunities in the Global Marketplace

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## 7. What threats and opportunities exist in the global marketplace?

To be successful in a foreign market, companies must fully understand the foreign environment in which they plan to operate. Politics, cultural differences, and the economic environment can represent both opportunities and pitfalls in the global marketplace.

### Political Considerations

We have already discussed how tariffs, exchange controls, and other governmental actions threaten foreign producers. The political structure of a country may also jeopardize a foreign producer's success in international trade.

Intense nationalism, for example, can lead to difficulties. Nationalism is the sense of national consciousness that boosts the culture and interests of one country over those of all other countries. Strongly nationalistic countries, such as Iran and New Guinea, often discourage investment by foreign companies. In other, less radical forms of nationalism, the government may take actions to hinder foreign operations. France, for example, requires pop music stations to play at least 40 percent of their songs in French. This law was enacted because the French love American rock and roll. Without airtime, American music sales suffer. In another example of nationalism, U.S.-based PPG made an unsolicited bid to acquire Netherlands-based Azko Nobel NV. There was a chorus of opposition from Dutch politicians to the idea of a foreign takeover of AzkoNobel, the Dutch paint manufacturer. The government warned that it would move to defend AzkoNobel from a hostile takeover attempt. AzkoNobel played up the sentiment, tweeting about its rejection of the hostile takeover with the hashtag #DutchPride.

Ellen Proper, "Dutch See Red Over Foreign Bid For Paint Giant," *Bloomberg News*, <https://www.bloomberg.com>, March 10, 2017.

In a hostile climate, a government may *expropriate* a foreign company's assets, taking ownership and compensating the former owners. Even worse is *confiscation*, when the owner receives no compensation. This happened during rebellions in several African nations during the 1990s and 2000s.

### Cultural Differences

Central to any society is the common set of values shared by its citizens that determine what is socially acceptable. Culture underlies the family, educational system, religion, and social class system. The network of social organizations generates overlapping roles and status positions. These values and roles have a tremendous effect on people's preferences and thus on marketers' options. For example, in China Walmart holds live fishing contests on the premises, and in South Korea the company hosts a food competition with variations on a popular Korean dish, kimchee.

Language is another important aspect of culture. Marketers must take care in selecting product names and translating slogans and promotional messages so as not to convey the wrong meaning. For example, Mitsubishi Motors had to rename its Pajero model in Spanish-speaking countries because the term refers to a sexual activity. Toyota Motor's MR2

model dropped the 2 in France because the combination sounds like a French swear word. The literal translation of Coca-Cola in Chinese characters means “bite the wax tadpole.”

Each country has its own customs and traditions that determine business practices and influence negotiations with foreign customers. For example, attempting to do business in Western Europe during the first two weeks in August is virtually impossible. Businesses close, and everyone goes on vacation at the same time. In many countries, personal relationships are more important than financial considerations. For instance, skipping social engagements in Mexico may lead to lost sales. Negotiations in Japan often include long evenings of dining, drinking, and entertaining; only after a close personal relationship has been formed do business negotiations begin. **(Figure)** presents some cultural dos and don'ts.

Cultural Dos and Don'ts Guidelines and Examples	
DO:	DON'T:
<ul style="list-style-type: none"><li>• Always present your business card with both hands in Asian countries. It should also be right-side-up and print-side-showing so that the recipient can read it as it is being presented. If you receive a business card, accept it with gratitude and examine it carefully. Don't quickly put it into your pocket.</li><li>• Use a “soft-sell” and subtle approach when promoting a product in Japan. Japanese people do not feel comfortable with America's traditional hard-selling style.</li><li>• Understand the role of religion in business transactions. In Muslim countries, Ramadan is a holy month when most people fast. During this time everything slows down, particularly business.</li><li>• Have a local person available to culturally and linguistically interpret any advertising that you plan to do. When American Airlines wanted to promote its new first-class seats in the Mexican market, it translated the “Fly in Leather” campaign literally, which meant “Fly Naked” in Spanish.</li></ul>	<ul style="list-style-type: none"><li>• Glad-hand, back-slap, and use first names on your first business meeting in Asia. If you do, you will be considered a lightweight.</li><li>• Fill a wine glass to the top if dining with a French businessperson. It is considered completely uncouth.</li><li>• Begin your first business meeting in Asia talking business. Be patient. Let your clients get to know you first.</li></ul>

## Economic Environment

The level of economic development varies considerably, ranging from countries where everyday survival is a struggle, such as Sudan and Eritrea, to countries that are highly developed, such as Switzerland and Japan. In general, complex, sophisticated industries are found in developed countries, and more basic industries are found in less developed nations. Average family incomes are higher in the more developed countries than in the least-developed markets. Larger incomes mean greater purchasing power and demand, not only for consumer goods and services but also for the machinery and workers required to produce consumer goods. **(Figure)** provides a glimpse of global wealth.

Business opportunities are usually better in countries that have an economic infrastructure in place. Infrastructure is the basic institutions and public facilities upon which an economy's development depends. When we think about how our own economy works, we tend to take our infrastructure for granted. It includes the money and banking system that provide the major investment loans to our nation's businesses; the educational system that turns out the incredible varieties of skills and basic research that actually run our nation's production lines; the extensive transportation and communications systems—interstate highways, railroads, airports, canals, telephones, internet sites, postal systems, and television stations—that link almost every piece of our geography into one market; the energy system that powers our factories; and, of course, the market system itself, which brings our nation's goods and services into our homes and businesses.

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## Where the Money Is

The Top 20	Gross National Income Per Capita* US\$
Luxembourg	103,199
Switzerland	79,243
Norway	70,392
Ireland	62,562
Qatar	60,787
Iceland	59,629
United States	57,436
Denmark	53,744
Singapore	52,961
Australia	51,850
Sweden	51,165
San Marino	46,447
Netherlands	45,283
Austria	44,498
Finland	43,169
Canada	42,210
Germany	41,902
Belgium	41,283
United Kingdom	40,096
Japan	38,912
<b>The Bottom Five</b>	
Madagascar	391
Central African Republic	364
Burundi	325
Malawi	295
South Sudan	233

\* **Gross National Income** is the value of the final goods and services produced by a country (Gross Domestic Product) together with its income received from other countries (such as interest and dividends) less similar payments made to other countries.

**Final goods** are the goods ultimately consumed rather than used in the production of another good. For example, a car sold to a consumer is a final good; the components, such as tires sold to the car manufacturer, are not. They are intermediate goods used to make the final good. The same tires, if sold to a consumer, would be a final good.

Sources: Some data refers to IMF staff estimates and some are actual figures for the year 2017, made on April 12, 2017. Adapted from the World Economic Outlook Database–April 2017, International Monetary Fund, accessed on April 18, 2017.

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1. Explain how political factors can affect international trade.
2. Describe several cultural factors that a company involved in international trade should consider.
3. How can economic conditions affect trade opportunities?

## Summary of Learning Outcomes

7. What threats and opportunities exist in the global marketplace?

Domestic firms entering the international arena need to consider the politics, economies, and culture of the countries where they plan to do business. For example, government trade policies can be loose or restrictive, countries can be nationalistic, and governments can change. In the area of culture, many products fail because companies don't understand the culture of the country where they are trying to sell their products. Some developing countries also lack an economic infrastructure, which often makes it very difficult to conduct business.

## Glossary

**infrastructure**

The basic institutions and public facilities upon which an economy's development depends.

**nationalism**

A sense of national consciousness that boosts the culture and interests of one country over those of all other countries.

Download for free at <http://cnx.org/contents/c3acb2ab-7d5c-45ad-b3cd-e59673fedd4e@8.80>



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## 32. The Impact of Multinational Corporations

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### 8. What are the advantages of multinational corporations?

Corporations that move resources, goods, services, and skills across national boundaries without regard to the country in which their headquarters are located are multinational corporations. Some are so rich and have so many employees that they resemble small countries. For example, the sales of both Exxon and Walmart are larger than the GDP of all but a few nations in the world. Multinational companies are heavily engaged in international trade. The successful ones take political and cultural differences into account.

Many global brands sell much more outside the United States than at home. Coca-Cola, Philip Morris's Marlboro brand, Pepsi, Kellogg, Pampers, Nescafe, and Gillette, are examples.

The Fortune 500 made over \$1.5 trillion in profit in 2016. In slow-growing, developed economies like Europe and Japan, a weaker dollar helps, because it means cheaper products to sell into those markets, and profits earned in those markets translate into more dollars back home. Meanwhile, emerging markets in Asia, Latin America, and Eastern Europe are growing steadily. General Electric expects 60 percent of its revenue growth to come from emerging markets over the next decade. For Brown-Forman, the spirits company, a fifth of its sales growth of Jack Daniels, the Tennessee whiskey, is coming from developing markets like Mexico and Poland. IBM had rapid sales growth in emerging markets such as Russia, India, and Brazil.

Source: "The World's Largest Corporations," *Fortune*, <http://fortune.com/global500/>, accessed June 30, 2017.

The largest multinational corporations in the world are shown in **(Figure)**.

Despite the success of American multinationals abroad, there is some indication that preference for U.S. brands may be slipping.



As overseas investment grows, so does the need for global branding. The Wisconsin National Guard picked NBA star Giannis Antetokounmpo to be the face of its recruiting and marketing effort. Recognizable to NBA fans the world over, Antetokounmpo personifies a youthful, dynamic spirit that transcends cultural and geographic boundaries. Why is it increasingly important that multinational advertisers identify and sign celebrity spokespersons capable of bridging different cultures? (Credit: Erik Drost/ Flickr/ Attribution-ShareAlike 2.0 Generic (CC BY 2.0))

## The Multinational Advantage

Large multinationals have several advantages over other companies. For instance, multinationals can often overcome trade problems. Taiwan and South Korea have long had an embargo against Japanese cars for political reasons and to help domestic automakers. Yet Honda USA, a Japanese-owned company based in the United States, sends Accords to Taiwan and Korea. In another example, when the environmentally conscious Green movement challenged the biotechnology research conducted by BASF, a major German chemical and drug manufacturer, BASF moved its cancer and immune-system research to Cambridge, Massachusetts.

Another advantage for multinationals is their ability to sidestep regulatory problems. U.S. drugmaker SmithKline and Britain's Beecham decided to merge in part so that they could avoid licensing and regulatory hassles in their largest markets. The merged company can say it's an insider in both Europe and the United States. "When we go to Brussels, we're a member state [of the European Union]," one executive explains. "And when we go to Washington, we're an American company."



South Korea's Samsung is a leading manufacturer of giant high-definition TVs. Samsung produces the largest curved ultra-high-definition (UHD) screens for the worldwide home-theater market. Samsung's monster 110-inch curved UHD screen is among the world's largest such screens. Unfortunately, for most of the world's consumers, the giant Samsung TVs can be too costly, but the 88-inch version can be purchased for under \$20,000. How does being a multinational corporation enable Samsung to succeed in the high-end electronics market? (Credit: Chris F/ Flickr/ Attribution 2.0 Generic (CC BY 2.0))

Multinationals can also shift production from one plant to another as market conditions change. When European demand for a certain solvent declined, Dow Chemical instructed its German plant to switch to manufacturing a chemical that had been imported from Louisiana and Texas. Computer models help Dow make decisions like these so it can run its plants more efficiently and keep costs down.



Source: Adapted from “The World’s Largest Corporations,”  
 Fortune<http://fortune.com/global500/>, accessed June 30, 2017.

#### The World’s Top 11 Largest Multinational Corporations

RANK	RANK COMPANY	Revenues (\$M)	Home Country
1	Walmart	\$482,130	United States
2	State Grid	\$329,601	China
3	China National Petroleum	\$299,271	China
4	Sinopec Group	\$294,344	China
5	Royal Dutch Shell	\$272,156	Netherlands
6	Exxon Mobil	\$246,204	United States
7	Volkswagen	\$236,600	Germany
8	Toyota Motor	\$236,592	Japan
9	Apple	\$233,715	United States
10	BP	\$225,982	United Kingdom
11	Berkshire Hathaway	\$210,821	United States

#### U.S. Brands Face Global Competition

America is the cradle of the consumer goods brand. Here, a free-spending and marketing-saturated public nurtured Apple, Google, Coca-Cola, Microsoft, and countless others to maturity. Many of those brands grew up to conquer other societies, as well.

But American brands’ domination in the global marketplace is eroding. From Samsung to Toyota to Mercedes Benz to SAP, companies in Europe and Asia are turning out top-quality goods and selling them as such rather than competing on price. “There are longer-term trends toward greater competition. The United States was the only global brand country [but] that’s no longer the case,” says Earl L. Taylor, chief marketing officer of the Marketing Science Institute. “Consumers prefer brands that they take to be of higher quality” regardless of the country of origin, he notes. “Increasingly, there will be other successful global brands in the U.S. [market].”

Of the brands at the top of Interbrand’s recent list of the world’s most valuable, four of the top five still originate in the United States; the five most valuable are Apple, Google, Coca-Cola, and Microsoft, while Toyota (Japan) comes in at number five. American companies have lost the most ground in the middle tier of recognizable brand names, says George T. Haley, professor of marketing at the University of New Haven’s School of Business.

One area from which U.S. brands are feeling the pressure is the Asia-Pacific region, which harbors the fastest-growing emerging markets today. In the appliance category, two Chinese companies, Haier and Kelon, are becoming top competitors for well-known U.S. brands Whirlpool and Maytag. In fact, Haier bought GE’s appliance division in 2016. The Chinese branding trend is not confined only to hard goods. Sporting goods and sportswear brand Li Ning, well known within China, is building its international profile. While the Chinese basketball team wore Nike uniforms at the Athens Olympic Games, the Spanish team wore Li Ning apparel. The threat to U.S. brands is not confined to China, however. South Korean brands, such as Samsung, LG, and Hyundai, have emerged on the global stage in specific categories, such as smartphones, household appliances, and automobiles.

The animosity that many Europeans feel toward the United States is translated into a preference for European or even Asian brands at the expense of U.S. brands. Plus, experts say, European brands are simply becoming stronger and more consistent.

Meanwhile, European brands are gaining momentum in the areas of white goods and consumer goods, putting the pressure on such well-known U.S. brands as Bissell and Hoover, experts say. For instance, Gaggenau is a popular, high-end European kitchen appliance brand, along with Bosch and Dyson. Other European brands maintaining cachet—if not always the allure of luxury—include Absolut, Virgin, Mini (as in Cooper), Red Bull, and Ikea.

#### Critical Thinking Questions

1. What can U.S. multinational firms do to regain and maintain their leadership in global branding? Are there sectors and product areas where U.S. brands are gaining share?
2. Do you think that the quality of American products and services is declining, or that the rest of the world is just getting better? Explain your answer.

Sources: “Interbrand: Best Global Brands 2016 Rankings,” <http://interbrand.com>, accessed June 30, 2017; Vasileios Davvetas and Adamantios Diamantopoulos (2016), “How Product Category Shapes Preferences toward Global and Local Brands: A Schema Theory Perspective,” *Journal of International Marketing*, 24 (4), 61–81; Deborah Vence, “Not Taking Care of Business?” *Marketing News*, March 15, 2005, pp. 19–20.

Multinationals can also tap new technology from around the world. In the United States, Xerox has introduced some 80 different office copiers that were designed and built by Fuji Xerox, its joint venture with a Japanese company. Versions of the super-concentrated detergent that Procter & Gamble first formulated in Japan in response to a rival’s product are now being sold under the Arielbrand name in Europe and under the Cheer and Tide labels in the United States. Also, consider Otis Elevator’s development of the Elevonic 411, an elevator that is programmed to send more cars to floors where demand is high. It was developed by six research centers in five countries. Otis’s group in Farmington, Connecticut, handled the systems integration, a Japanese group designed the special motor drives that make the elevators ride smoothly, a French group perfected the door systems, a German group handled the electronics, and a Spanish group took care of the small-gear components. Otis says the international effort saved more than \$10 million in design costs and cut the process from four years to two.

Finally, multinationals can often save a lot in labor costs, even in highly unionized countries. For example, when Xerox started moving copier-rebuilding work to Mexico to take advantage of the lower wages, its union in Rochester, New York, objected because it saw that members’ jobs were at risk. Eventually, the union agreed to change work styles and to improve productivity to keep the jobs at home.

1. What is a multinational corporation?
2. What are the advantages of multinationals?

## Summary of Learning Outcomes

8. What are the advantages of multinational corporations?

Multinational corporations have several advantages. First, they can sidestep restrictive trade and licensing restrictions because they frequently have headquarters in more than one country. Multinationals can also move their operations from one country to the next depending on which location offers more favorable economic conditions. In addition, multinationals can tap into a vast source of technological expertise by drawing upon the knowledge of a global workforce.

## Glossary

### **multinational corporations**

Corporations that move resources, goods, services, and skills across national boundaries without regard to the country in which their headquarters are located.

Download for free at <http://cnx.org/contents/c3acb2ab-7d5c-45ad-b3cd-e59673fedd4e@8.80>



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# 33. Trends in Global Competition

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## 9. What are the trends in the global marketplace?

In this section, we will examine several underlying trends that will continue to propel the dramatic growth in world trade. These trends are market expansion, resource acquisition, and the emergence of China and India.

### Market Expansion

The need for businesses to expand their markets is perhaps the most fundamental reason for the growth in world trade. The limited size of domestic markets often motivates managers to seek markets beyond their national frontiers. The economies of large-scale manufacturing demand big markets. Domestic markets, particularly in smaller countries like Denmark and the Netherlands, simply can't generate enough demand. Nestlé was one of the first businesses to "go global" because its home country, Switzerland, is so small. Nestlé was shipping milk to 16 different countries as early as 1875. Today, hundreds of thousands of businesses are recognizing the potential rich rewards to be found in international markets.

### Resource Acquisition

More and more companies are going to the global marketplace to acquire the resources they need to operate efficiently. These resources may be cheap or skilled labor, scarce raw materials, technology, or capital. Nike, for example, has manufacturing facilities in many Asian countries in order to use cheaper labor. Honda opened a design studio in southern California to put that "California flair" into the design of some of its vehicles. Large multinational banks such as Bank of New York and Citigroup have offices in Geneva, Switzerland. Geneva is the private banking center of Europe and attracts capital from around the globe.

### The Emergence of China and India

China and India—two of the world's economic powerhouses—are impacting businesses around the globe, in very different ways. The boom in China's worldwide exports has left few sectors unscathed, be they garlic growers in California, jeans makers in Mexico, or plastic-mold manufacturers in South Korea. India's impact has altered how hundreds of service companies from Texas to Ireland compete for billions of dollars in contracts.

The causes and consequences of each nation's growth are somewhat different. China's exports have boomed largely thanks to foreign investment: lured by low labor costs, big manufacturers have surged into China to expand their production base and push down prices globally. Now manufacturers of all sizes, making everything from windshield wipers to washing machines to clothing, are scrambling either to reduce costs at home or to outsource more of what they make in cheaper locales such as China and India.

Vijay Govindarajan and Gunjan Bagla, "Understanding the Rise of Manufacturing in India," *Harvard Business Review*, September 18, 2015.

Indians are playing invaluable roles in the global innovation chain. Hewlett-Packard, Cisco Systems, and other tech giants now rely on their Indian teams to devise software platforms and multimedia features for next-generation devices. Google principal scientist Krishna Bharat set up the Google Bangalore lab complete with colorful furniture, exercise balls, and a Yamaha organ-like Google's Mountain View, California, headquarters—to work on core search-engine technology. Indian engineering houses use 3-D computer simulations to tweak designs of everything from car engines and forklifts to aircraft wings for such clients as General Motors Corp. and Boeing Co. Barring unforeseen circumstances, within five years India should vault over Germany as the world's fourth-biggest economy. By mid-century, China should overtake the United States as number one. By then, China and India could account for half of global output.

"As IMF Says, India Should Be One Of World's Largest Economies, Only Bad Policy Has Prevented It," *Forbes*, <https://www.forbes.com/sites/timworstall/2017/04/28/as-imf-says-india-should-be-one-of-worlds-largest-economies-only-bad-policy-has-prevented-it/#160c27b05a6b>, April 28, 2017.

#### The United Nations Sustainability Development Goals

Corporations like Albertson's, Unilever, Kimberly Clark, and Siemens are starting to take action on the United Nations Sustainability Development Goals. For many years, through corporate social responsibility (CSR) programs, corporations have donated money and employee time to address various social and environmental problems, both globally and in their own backyards. The Carnegie Foundation and the Bill and Melinda Gates Foundation are examples of this commitment. While these efforts have achieved some progress in environmental protection, ethical business practices, building sustainable positive impacts, and economic development by organizations, they do require deeper and longer engagement. Because the benefits to corporations' profitability are mostly peripheral, short-term impacts such as a drop in demand often mean that attention is drawn away from CSR programs to attending to immediate bottom-line issues.

In 2015, the United Nations member-nations adopted 17 resolutions aimed at ending poverty, ensuring sustainability, and ensuring prosperity for all. The aggressive goals were set to be met over the next 15 years.

1. End poverty in all its forms everywhere.
2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure availability and sustainable management of water and sanitation for all.
7. Ensure access to affordable, reliable, sustainable, modern energy for all.
8. Promote sustained, inclusive, sustainable economic growth; full and productive employment; and decent work for all.
9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
10. Reduce inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient, and sustainable.
12. Ensure sustainable consumption and production patterns.
13. Take urgent action to combat climate change and its impacts.
14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.
15. Protect, restore, and promote sustainable use of terrestrial ecosystems; sustainably manage forests; combat desertification and halt and reverse land degradation; and halt biodiversity loss.
16. Promote peaceful and inclusive societies for sustainable development; provide access to justice for all; and build effective, accountable, inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Companies like Albertson's recognize that a robust CSR program can enhance a corporation's reputation, which can indirectly boost the bottom line. They used number 14 on the United Nations Sustainability Development list in concert

with World Oceans Day to announce that they as a company pledged to meet the U.N. goals. “We recognize that the wellbeing of people and the sustainability of our oceans are interdependent. As one of the largest U.S. retailers of seafood, we are committed to protecting the world’s oceans so they can remain a bountiful natural resource that contributes to global food security, the livelihoods of hard-working fishermen and the global economy,” said Buster Houston, Director of Seafood at Albertson’s Companies. The company is also committed to the concept of fair trade and was the first retailer to sell tuna with the fair trade seal.

Siemens, the German-based multinational, also supported the adoption of meeting the United Nations Sustainability Development goals, which they believe is based on their company values—responsible, excellent, innovative. They define sustainable development as the means to achieve profitable and long-term growth. In doing so, they align ourselves with the goals of the UN’s 2030 Agenda for Sustainable Development.

#### Critical Thinking Questions

1. Why would companies pledge to meet the United Nations Sustainability Development goals when their competitors could ignore them in the name of greater, perhaps short-term, profits?
2. Are you as a consumer more likely to purchase products from Albertson’s rather than another grocery chain that did not agree to the United Nations sustainability program? If you were working for a company deciding to purchase a large industrial component that was 10% more expensive than a competing product, would Siemens’s affirmation of meeting the United Nations Sustainability Development goals sway your decision? How would you explain the rationale for your decision?

Sources: Thane Kreiner, “Corporations and Social Entrepreneurship: A Shift?” <https://www.scu.edu>, accessed June 30, 2017; United Nations Sustainable Development website: <http://www.un.org>, accessed June 30, 2017; “Practicing Sustainability—in the Interest of Future Generations,” <https://www.siemens.com>, accessed June 30, 2017; “Albertsons Companies Commits to United Nations Sustainable Development Goals, Joins Influential Seafood Task Force,” *Cision PR Newswire*, <http://www.prnewswire.com>, June 6, 2017; Ingrid Embree, “How 17 Companies Are Tackling Sustainable Development Goals (and Your Company Can, Too),” *Huffington Post*, <http://www.huffingtonpost.com>, September 14, 2016.

An accelerating trend is that technical and managerial skills in both China and India are becoming more important than cheap assembly labor. China will stay dominant in mass manufacturing and is one of the few nations building multibillion-dollar electronics and heavy industrial plants. India is a rising power in software, design, services, and precision industry.

1. What trends will foster continued growth in world trade?
2. Describe some of the ways businesses can take advantage of these trends to “go global.”

## Summary of Learning Outcomes

9. What are the trends in the global marketplace?

Global business activity will continue to escalate due to several factors. Firms that desire a larger customer base or need additional resources will continue to seek opportunities outside their country’s borders. China and India are emerging as global economic powerhouses.

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PART V

## CHAPTER 5: QUALITY!



# 34. Looking for a Better Way: Improving Production and Operations

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How can quality management and lean manufacturing techniques help firms improve production and operations management?

Competing in today's business world is challenging. To compete effectively, firms must keep production costs down. At the same time, however, it's becoming increasingly complex to produce and deliver the high-quality goods and services customers demand. Methods to help meet these challenges include quality management techniques, lean manufacturing, and technology and automation.

## Putting Quality First

Successful businesses recognize that quality and productivity must go hand in hand. Quality goods and services meet customer expectations by providing reliable performance. Defective products waste materials and time, increasing costs. Worse, poor quality causes customer dissatisfaction, which usually results in lost sales.

A consumer measures quality by how well a product serves its purpose. From the manufacturer's point of view, quality is the degree to which the product conforms to a set of predetermined standards. Quality control involves creating quality standards, producing goods that meet them, and measuring finished goods and services against them. It takes more than just inspecting goods at the end of the assembly line to ensure quality control, however. Quality control requires a company-wide dedication to managing and working in a way that builds excellence into every facet of operations.

Dr. W. Edwards Deming, an American management consultant, was the first to say that quality control should be a company-wide goal. His ideas were adopted by the Japanese in the 1950s but largely ignored in the United States until the 1970s. Deming believed that quality control starts with top management, who must foster a company-wide culture dedicated to producing quality.

Deming's concept of Total Quality Management (TQM) emphasizes the use of quality principles in all aspects of a company's production and operations. It recognizes that all employees involved with bringing a product or service to customers—marketing, purchasing, accounting, shipping, manufacturing—contribute to its quality. TQM focuses on continuous improvement, a commitment to constantly seek better ways of doing things in order to achieve greater efficiency and improve quality. Company-wide teams work together to prevent problems and systematically improve key processes instead of troubleshooting problems only as they arise. Continuous improvement continually measures performance using statistical techniques and looks for ways to apply new technologies and innovative production methods.

Another quality-control method is the Six Sigma quality program. Six Sigma is a company-wide process that focuses on measuring the number of defects that occur and systematically eliminating them in order to get as close to “zero defects” as possible. In fact, Six Sigma quality aims to have every process produce no more than 3.4 defects per million. Six Sigma focuses on designing products that not only have fewer defects but that also satisfy customer needs. A key process of Six Sigma is called DMAIC. This stands for Define, Measure, Analyze, Improve, and Control. Employees at all levels define what needs to be done to ensure quality, then measure and analyze production results using statistics to see if standards are met. They are also charged with finding ways to improve and control quality.

General Electric was one of the first companies to institute Six Sigma throughout the organization. GE employees

are trained in Six Sigma concepts, and many analysts believe this has given GE a competitive manufacturing advantage. Service firms and government entities have applied Six Sigma to their quality initiatives as well.

### *Malcolm Baldrige National Quality Award*

Named for a former secretary of commerce, the Malcolm Baldrige National Quality Award was established by the U.S. Congress in 1987 to recognize U.S. companies that offer goods and services of world-class quality. The award promotes awareness of quality and allows the business community to assess which quality control programs are most effective.

Administered by the U.S. Department of Commerce's National Institute of Standards and Technologies (NIST), the award's most important criterion is a firm's effectiveness at meeting customer expectations, as well as demonstrating that it offers quality goods and services. To qualify for the award, a company must also show continuous improvement in internal operations. Company leaders and employees must be active participants in the firm's quality program, and they must respond quickly to data and analysis.

Organizations in a wide variety of industries have won the Baldrige Award since it was first presented in 1987. In 2017, for example, the Baldrige Award winners included Bristol Tennessee Essential Services, an electricity and fiber services utility company, in the small business sector; the city of Fort Collins, Colorado, in the nonprofit sector; and Southcentral Foundation in Anchorage, Alaska, in the health care sector.

"Best of the Best" Win U.S. National Excellence Honor: 2017 Baldrige Award Goes to 5 Outstanding Organizations,"

<https://www.commerce.gov>, November 16, 2017.

### *Worldwide Excellence: International Quality Standards*

The International Organization for Standardization (ISO), located in Geneva, Switzerland, is an industry organization that has developed standards of quality that are used by businesses around the world. ISO 9000, introduced in the 1980s, is a set of five technical standards designed to offer a uniform way of determining whether manufacturing plants and service organizations conform to sound quality procedures. To register, a company must go through an audit of its manufacturing and customer service processes, covering everything from how it designs, produces, and installs its products, to how it inspects, packages, and markets them. Over 500,000 organizations worldwide have met ISO 9000 standards.

ISO 14000, launched after ISO 9000, was designed in response to environmental issues such as global warming and water pollution and promotes clean production processes. To meet ISO 14000 standards, a company must commit to continually improving environmental management and reducing pollution resulting from its production processes.

### *Lean Manufacturing Trims the Fat*

Manufacturers are discovering that they can better respond to rapidly changing customer demands, while keeping inventory and production costs down, by adopting lean-manufacturing techniques. Lean manufacturing streamlines production by eliminating steps in the production process that do not add benefits customers want. In other words, *non-value-added production processes* are cut so that the company can concentrate its production and operations resources on items essential to satisfying customers. Toyota was a pioneer in developing these techniques, but today manufacturers in many industries have adopted the lean-manufacturing philosophy.

Another Japanese concept, just-in-time (JIT), goes hand in hand with lean manufacturing. JIT is based on the belief that materials should arrive exactly when they are needed for production, rather than being stored on-site. Relying

closely on computerized systems such as MRP, MRP II, and ERP, manufacturers determine what parts will be needed and when and then order them from suppliers so they arrive “just in time.” Under the JIT system, inventory and products are “pulled” through the production process in response to customer demand. JIT requires close teamwork between vendors and purchasing and production personnel because any delays in deliveries of supplies could bring JIT production to a halt.

Unexpected events like the September 11 terrorist attacks or the shutdown of ports due to Hurricane Harvey and the devastation and flooding caused by Hurricane Maria in Puerto Rico can cause chaos in the supply chains of manufacturers, resulting in problems for firms relying on JIT. But if employed properly, and in spite of these risks, a JIT system can greatly reduce inventory-holding costs and smooth production highs and lows.

1. How can managers use techniques to improve efficiency?
2. Define Six Sigma.
3. What was Edward Demming’s contribution to operations management?

## Summary of Learning Outcomes

How can quality-management and lean-manufacturing techniques help firms improve production and operations management?

Quality and productivity go hand in hand. Defective products waste materials and time, increasing costs. Poor quality also leads to dissatisfied customers. By implementing quality-control methods, firms can reduce these problems and streamline production. Lean manufacturing also helps streamline production by eliminating unnecessary steps in the production process. When activities that don’t add value for customers are eliminated, manufacturers can respond to changing market conditions with greater flexibility and ease.

### Glossary

**continuous improvement**

A commitment to constantly seek better ways of doing things in order to achieve greater efficiency and improve quality.

**ISO 9000**

A set of five technical standards of quality management created by the International Organization for Standardization to provide a uniform way of determining whether manufacturing plants and service organizations conform to sound quality procedures.

**ISO 14000**

A set of technical standards designed by the International Organization for Standardization to promote clean production processes to protect the environment.

**just-in-time (JIT)**

A system in which materials arrive exactly when they are needed for production, rather than being stored on-site.

**lean manufacturing**

Streamlining production by eliminating steps in the production process that do not add benefits that customers want.

**Malcolm Baldrige National Quality Award**

An award given to recognize U.S. companies that offer goods and services of world-class quality; established by Congress in 1987 and named for a former secretary of commerce.

**quality**

Goods and services that meet customer expectations by providing reliable performance.

**quality control**

The process of creating quality standards, producing goods that meet them, and measuring finished goods and services against them.

**Six Sigma**

A quality-control process that relies on defining what needs to be done to ensure quality, measuring and analyzing production results statistically, and finding ways to improve and control quality.

**Total Quality Management (TQM)**

The use of quality principles in all aspects of a company's production and operations.

Download for free at <http://cnx.org/contents/c3acb2ab-7d5c-45ad-b3cd-e59673fedd4e@8.80>



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# 35. Quality and its importance

ELLEN MATHEIN

## Basic Principles of Total Quality Management

The basic principles for the Total Quality Management philosophy of doing business are to satisfy the customer, satisfy the supplier, and continuously improve the business processes.

### *Satisfy the Customer*

The first, and major, TQM principle is to satisfy the customer—the person who pays for the product or service. Customers want to get their money's worth from a product or service they purchase.

**Satisfy the Users:** If the user of the product is different than the purchaser, then both the user and customer must be satisfied, although the person who pays gets priority.

**Company Philosophy:** A company that seeks to satisfy the customer by providing them value for what they buy and the quality they expect will get more repeat business, referral business, and reduced complaints and service expenses. Some top companies not only provide quality products but also give extra service to make their customers feel important and valued.

**Internal Customers:** Within a company, a worker provides a product or service to his or her supervisors. If the person has any influence on the wages the worker receives, that person can be thought of as an internal customer. A worker should have the mindset of satisfying internal customers in order to keep his or her job and to get a raise or promotion.

**Chain of Customers:** Often in a company, there is a chain of customers—each improving a product and passing it along until it is finally sold to the external customer. Each worker must not only seek to satisfy the immediate internal customer, but must also look up the chain to try to satisfy the ultimate customer.

### *Satisfy the Supplier*

A second TQM principle is to satisfy the supplier, which is the person or organization from whom you are purchasing goods or services.

**External Suppliers:** A company must look to satisfy their external suppliers by providing them with clear instructions and requirements and then paying them fairly and on time. It is in the company's best interest that its suppliers provide quality goods or services if the company hopes to provide quality goods or services to its external customers.

**Internal Suppliers:** A supervisor must try to keep workers happy and productive by providing good task instructions, the tools they need to do their job, and good working conditions. The supervisor must also reward the workers with praise and good pay.

**Get Better Work:** The reason to do this is to get more productivity out of the workers, as well as to keep the good workers. An effective supervisor with a good team of workers will certainly satisfy his or her internal customers.

**Empower Workers:** One area of satisfying the internal supplier is by empowering the workers. This means allowing them to make decisions on things that they can control. This not only takes the burden off the supervisor, but it also motivates these internal suppliers to do better work.

## Continuous Improvement

The third principle of TQM is continuous improvement. You can never be satisfied with the method used, because there always can be improvements. The competition is always improving, so it is necessary to strive to keep ahead of the game.

**Work Smarter, Not Harder:** Some companies have tried to improve by making employees work harder. This may be counterproductive, especially if the process itself is flawed. For example, trying to increase worker output on a defective machine may result in more defective parts. Examining the source of problems and delays and then solving those problems is what works best. Often, the process has bottlenecks that are the real cause of the problem. Those are what should be removed.

**Worker Suggestions:** Workers are often a source of continuous improvements. They can provide suggestions on how to improve a process and eliminate waste or unnecessary work.

**Quality Methods:** There are also many quality methods, such as just-in-time production, variability reduction, and poka-yoke, that can improve processes and reduce waste.

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# 36. Quality Philosophies

ELLEN MATHEIN

## Six Sigma

During the last couple of decades small, mid-sized and Fortune 500 companies have embraced Six Sigma to generate more profit and greater savings. So what is Six Sigma?

Six Sigma is a data-driven approach for eliminating defects and waste in any business process. You can compare Six Sigma with turning your water faucet and experiencing the flow of clean, clear water. Reliable systems are in place to purify, treat, and pressure the water through the faucet. That is what Six Sigma does to business: it treats the processes in business so that they deliver their intended result.

What is “Sigma”? The word is a statistical term that measures how far a given process deviates from perfection. Sigma is a way to measure quality and performance. The central idea behind Six Sigma is that if you can measure how many “defects” you have in a process, you can systematically figure out how to eliminate them and get as close to “zero defects” as possible. This workshop will give participants an overview of the Six Sigma methodology, and some of the tools required to deploy Six Sigma in their own organizations.

### Understanding Lean

Lean and Six Sigma are buzz-words we hear in business all of the time. Before we get started, let's make sure we all understand just what we mean by “lean” and “Six Sigma”.

### About Six Sigma

- Six Sigma is a structured, data-driven process of solving critical issues from a business perspective that we haven't been able to solve with current methodology.
- Six Sigma is the single most effective problem-solving methodology for improving business and organizational performance.
- The common measurement scale is called the Sigma capability or Z and is a universal scale. It is a scale like a yardstick measuring inches or a thermometer measuring temperature.
- The scale allows us to compare business processes in terms of the capability to stay within the quality limits established for that process.
- The Sigma scale measures Defects per Million Opportunities (DPMO). Six Sigma equates to 3.4 defects per million opportunities.

What Six Sigma is and is not:

- Six Sigma is not an add-on to normal business activities.
- It is an integrated part of the improvement process.
- Six Sigma is management methodology driven by data.
- Six Sigma focuses on projects that will produce measurable business results.
- Six Sigma is not a standard, a certification or a metric like percentage.
- The central idea behind Six Sigma is that if you can measure how many “defects” you have in a process, you can systematically determine how to eliminate those and approach “zero defects”.
- Sigma is a value from 1 to 6 that signifies the maximum number of defects per million:
- 1 Sigma = 690,000 defects/million = 31% accurate
- 2 Sigma = 308,537 defects/million = 69.1463% accurate
- 3 Sigma = 66,807 defects/million = 93.3193% accurate
- 4 Sigma = 6,210 defects/million = 99.3790% accurate
- 5 Sigma = 233 defects/million = 99.9767% accurate

- 6 Sigma = 3.4 defects/million = 99.999997% accurate
- Six Sigma is about reducing variation.
- Six Sigma find out the facts before acting.

### About Lean

“Lean” means continuously improving towards the ideal and achieving the shortest possible cycle time through the tireless reduction of waste.

- It is focused on eliminating waste in all processes
- It is about expanding capacity by reducing costs and shortening cycle times
- It is about understanding what is important to the customer
- It is not about eliminating people

Examples of Lean Projects:

- Reduced inventory
- Reduced floor space
- Quicker response times and shorter lead times
- Decreased defects, rework, scrap
- Increased overall productivity

### History Behind Lean

The phrase “lean manufacturing” was coined in the 1980’s and has its roots in the Toyota Production System. (See later in this module)

Most of the basic goals of lean manufacturing are common sense, and some fundamental thoughts have been traced back to the writings of Benjamin Franklin.

Henry Ford cited Franklin as a major influence on his lean business practices, which included Just-in-time manufacturing. The founders of Toyota designed a process with inspiration from Henry Ford and their visits to the United States to observe the assembly line and mass production that had made Ford rich. The process is called the Toyota Production System, and is the fundamental principle of lean manufacturing.

Two books have since shaped the ideologies of Lean: “*The machine that changed the world*” (1990) and “*Lean Thinking*” (1996).

### **Toyota Production Systems**

The Toyota Production System (TPS) is a mindset and management system that embraces continuous improvement. TPS organizes manufacturing and logistics, including interaction with suppliers and customers. Originally called “Just in Time Production,” it builds on the approach created by the founders of Toyota. TPS revolves around 5 simple steps:

1. Define Value of your product > Make it according to Customer needs and Customer Defined
2. Identify Value Stream of your product > Follow the product and identify unnecessary actions
3. Study the Flow your product > Eliminate All Waste
4. Make only what the customer orders > Produce Just In Time for Demand
5. Strive for Perfection > Continuous Improvement. Good enough is never enough.

### The Toyota Precepts

The five methods defined by Toyota contain some basic principles:

1. **CHALLENGE:** Form a long-term vision, meeting challenge with courage and creativity to realize your dreams.

- Create Value through Manufacturing and Delivery of Products and Services
  - Nurture a spirit of Challenge
  - Always have a Long Range Perspective
  - Thorough Consideration in Decision Making
2. **KAIZEN:** Improve your business operations continuously, always driving for innovation and evolution.
- Have a Kaizen Mind and Innovative Thinking (See later this module)
  - Build Lean Systems and Structure
  - Promote Organizational Thinking
3. **GENCHI GENBUTSU (Go and see):** Go to the source to find the facts to make correct decisions, build consensus, and achieve goals at our best speed.
- Genchi Genbutsu (Go and See)
  - Lead with Consensus Building
  - Create Commitment to Achievement
4. **RESPECT:** Respect others, make every effort to understand each other, take responsibility and do your best to build mutual trust.
- Respect for Stakeholders and community
  - Develop Mutual Trust and Mutual Responsibility
  - Be Sincere, transparent and open in all Communication
5. **TEAMWORK:** Stimulate personal and professional growth, share the opportunities of development, and maximize individual and team performance.
- Have Commitment to Education and Development
  - Have Respect for the Individual; Realizing Consolidated Power as a Team



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PART VI

## CHAPTER 6: PROJECT MANAGEMENT



# 37. What is a Project?

ELLEN MATHEIN

## What is a Project?

A project is a limited endeavor (meaning it has specific start and finish dates) that is undertaken to meet particular goals and objectives. Projects are different than processes or everyday operations, which are repetitive, permanent, or semi-permanent functional work taken on to produce products or services.

All successful projects share the following characteristics:

- Clear goals
- Defined ownership/responsibility
- Timeline
- Dedicated team
- Defined methodology
- Controlled execution
- Completion evaluated based on original plan
- Linked to business objectives
- Supported by an organization's management team

## What is Project Management?

Project management is the combined art and science of planning, organizing, and managing resources to get a particular project done on time, within budget, and with the results that the organization set out to achieve.

There are many types of project management designed for different scenarios and different industries. This workshop will focus on the traditional method, used by the Project Management Institute, which follows five process groups.

## What is a Project Manager?

A project manager is the person responsible and accountable for accomplishing the stated project objectives. Key project management responsibilities include creating clear and attainable project objectives, building the project requirements, and managing the triple constraint for projects.

The project manager is often required to perform a juggling act, balancing what the customer wants, and needs with what the team can provide in a particular time frame and with a particular budget. A successful project manager has a hodgepodge of skills and continues learning.

Key skills include:

- Leadership
- Negotiation
- Influence and persuasion
- Project management
- Communication
- Time management
- Stress and anger management

Although you do need project management skills to be a project manager, you don't need to be a project manager to use project management skills. You will find uses for most of the tools that we discuss today in your day-to-day life, both personal and professional.



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# 38. The Pieces of a Project

ELLEN MATHEIN

## Initiation

The first phase of project management is initiation. This is where the project starts to take shape. Stakeholders and team members work together to identify wants and needs, and then the project team creates a plan to accomplish the objectives with the time and budget available. This module will explore the first part of that process: identifying what success will look like for your particular project.

### Identifying Your Stakeholders

A stakeholder is someone who has an interest in the development and/or outcome in the project. This person is usually only involved at key project gateways, such as project initiation and evaluation. Their main role is to provide feedback and guidance.

When you are identifying stakeholders, think outside the box. Ask other members of the team and the organization, “Who else should we involve in this? Who might be affected?”

If it turns out you missed a stakeholder, ask them for their feedback. You may not be able to change the project’s course at that point, but you may receive valuable information on possible opportunities or potential issues.

### Assessing Needs and Wants

When stakeholders and other project members begin identifying the goals of the project, encourage them to list any and all possibilities. If the sky is the limit, what would they want the project to accomplish?

Then, they should decide which items are necessary for the project’s success (needs), and which are “nice to have” (wants). If the list is lengthy, wants and needs can be prioritized to help the project team identify the most important tasks. (Remember, this is not a final list, just brainstorming to kick things off.)

To wow your stakeholders, keep this list on hand during the project. Keep an eye out for ways to incorporate wants and maximize their value.

### Setting a SMART Project Goal

Each project should have a goal statement. SMART is a convenient acronym for the set of criteria that a goal must have in order for it to be realized by the goal achiever.

- **Specific:** In order for the project team to achieve a goal, stakeholders must be very clear about what they want. As Jack Canfield says, “Vague goals produce vague results.”
- **Measurable:** It’s crucial that you are able to track your progress towards your goal. That’s why all goals need some form of objective measuring system so that you can stay on track and become motivated when you enjoy the sweet taste of quantifiable progress.
- **Agreed Upon:** All team members and stakeholders must agree on the goal.
- **Relevant:** The goal must be relevant to the business’ purpose.
- **Timed:** In order for a project to be considered a project, it must have a specific start and end date.

Some examples of good project goals:

- To upgrade the existing sales system to EasySell 5.1 by January 1, 2021.
- To begin production of a new widget by September 1, 2021.
- To build a new 5,000 square foot office facility and have all staff relocated to it by December 31, 2022.

## Creating Requirements and Deliverables

Now that we have some idea of what we want our project to accomplish, we can begin setting requirements.

Requirements outline exactly what a project must do in order for it to be considered successful. Remember, good requirements are highly specific. Although they are particularly useful in IT projects, they should be used for any project that you want to succeed.

For example, let's say one goal for our project is this: "To reduce the time to process inbound orders to 15 minutes by January 1, 2020." A corresponding project requirement could be, "Implement version 5.0 of Superior Records Processing on all 14 customer service representative stations."

As part of this, you should then be able to create your deliverables. These define what people can expect to hold in their hands after the project is complete. These deliverables will help you set clear expectations at the beginning of your project, and maintain a clear idea of what you are doing as you execute the project.



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## 39. Put it in writing

ELLEN MATHEIN

Once you have an idea of who your stakeholders are and what the project will achieve, it's time to put it all in writing. This module will look at four key project documents: the statement of work, the project requirements document, the project planning worksheet, and the project charter.

### Creating a Statement of Work

What is the Statement of Work (SOW)? The SOW defines what the project will do and when it will be done. It forms a binding contract of expectations between all project stakeholders. As such, it should be created by the project team, and then signed off by the team and the stakeholders. It can be used to create other project documents, including the project charter. The SOW often varies widely between organizations. However, the following basic elements should be included.

- **Project Team:** Include all members of the project team and each person's role, as well as a list of stakeholders and the sponsor.
- **Project Details:** Include the name of the project, its estimated start and end date, and the client(s) involved. (Every project should have a client, whether it is an internal or external customer.)
- **Purpose:** What is the purpose of the project? Try to keep this as simple and concrete as possible. If a business case or a cost-benefit analysis has been prepared, those documents should be referenced (but not included) here.
- **Scope:** What will the project encompass? What items will the project not encompass? This section is extremely important as it will help avoid miscommunication and disappointment down the road.
- **Goals, Deliverables, and Requirements:** Include your SMART goals, deliverables, and requirements here.
- **Basic Finances:** List applicable rate and payment schedule information.
- **Assumptions:** List any assumptions that have been made in the planning thus far.
- **Agreements:** List any agreements that will apply to this project, such as union contracts or professional service agreements.

### Completing the Project Planning Worksheet

Once the basics of the project are laid out, it's time to put together your project planning worksheet. While the Statement of Work will remain static throughout the project, your worksheet will be a living, breathing document. As such, there are parts that you will not complete until after the Planning phase, but this worksheet will give you one place to capture the essential information about your project.

Like the SOW, you may need different fields based on your project and your organization, but we have included a sample worksheet on the next page.

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## Project Planning Worksheet

### Part I: Basic Information

Project Name: \_\_\_\_\_ Project Team Members: \_\_\_\_\_

Estimated Project Start Date: \_\_\_\_\_

Estimated Project End Date: \_\_\_\_\_

Budget Amount (if known): \_\_\_\_\_

### Part II: Project Goals

List your SMART goals here.

### Part III: Milestones

Milestone	Target Completion Date
-----------	------------------------

Approved by: \_\_\_\_\_

---

## Completing the Project Charter

The project charter is the final, formal project document. It establishes the project as an entity and it gives the project manager the authority to get started. For small projects, the charter may be just a few pages. For large projects, the charter itself can be hundreds of pages and can take months to build.

Just like other project documents, the charter can be customized for your organization. At a minimum, it should include the following information:

- Project name
- Project due date
- Team list, including responsibility matrix
- Stakeholders
- In scope and out of scope items
- Goals
- Requirements
- Deliverables
- Estimated cost vs. budget
- Benefits of project (including cost-benefit analysis if appropriate)
- Milestone descriptions and dates
- Possible risks and opportunities
- Communication plans
- Assumptions and Constraints
- Plans for documenting lessons learned
- A page for sign off by the important parties

Ask your organization if they have a charter form that they would like you to use. This is especially important as a charter can be a legally binding documents.

Planning (I)

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*Those who fail to plan, plan to fail.*  
**Anonymous**

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Congratulations! With the completion of the SOW, planning worksheet, and project charter, the initiation phase is complete. Now it's time to plan the nuts and bolts of your project.



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# 40. Tasks and Deadlines

ELLEN MATHEIN

## Creating a Task List

To begin the nuts-and-bolts planning process, you must first make a list of all the tasks that are going to be done. Let's say you are going to paint a room. Tasks might include:

- Get paint samples
- Choose a paint color
- Remove all furniture
- Take off trim
- Paint trim
- Apply first coat
- Apply second coat
- Put trim back in
- Put all furniture back in

How detailed the task list becomes is up to you. We suggest writing the task list in the way that you will accomplish it. For example, if you are going to apply the first coat of paint yourself, you may want to include all steps, such as crack-filling, sanding, taping, etc. If, however, you are contracting the task out, "Apply first coat" may be the only item you need to monitor. (Your painter probably wouldn't appreciate being micro-managed!)

## Estimating Time

When building your schedule, never guess times. Gather the most reliable information possible and use a scientific formula to get the best estimate. The better your estimates, the more reliable your plan will be.

First, make a table, list your tasks, and fill in the estimated time for each. (We have numbered our tasks in the example on the next page for easy identification.) Time can be listed in minutes, hours, days, weeks, months, or years. You should keep the same time scale for each task.

Next, identify what the best and worst case estimates would be. Now, for each task, plug the numbers into the formula given above. The result is the estimated time.

Task	Estimate of Time
1. Get paint samples	
2. Choose a paint color	
3. Remove all furniture	
4. Take off trim	
5. Paint trim	
6. Apply first coat	
7. Apply second coat	
8. Put trim back in	
9. Put all furniture back in	



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# 4I. Estimating Resources and Costs

ELLEN MATHEIN

## Estimating Resources

Now that the task list is complete, it's time to decide what resources will be used to accomplish the tasks. In project management, "resources" means people, materials, and money. For now, let's just focus on people and materials – we'll look at money in a moment.

A common method of resource listing is to list the tasks, estimated time, and resources required, all in the same table. We have started an example here.

Task	Calculated Time	People Required	Materials Required
1. Get paint samples	1 hour	Me, Joe	Car
2. Choose a paint color	2 hours	Me, Joe	Paint Samples
3. Remove all furniture	1 hour		
4. Take off trim	½ hour		
5. Paint trim	1 hour		
6. Apply first coat	2 hours		
7. Apply second coat	2 hours		
8. Put trim back in	½ hour		
9. Put all furniture back in	1 hour		

How detailed you get with your resource list is up to you. For people resources, make sure you include all people who are going to be spending their time on the project, even yourself.

## Estimating Costs

Our next step is to add cost information to our table. Make sure to include salary information for everyone, even project team members, and to include line item cost information for each material resource. If you are doing a home project (as we are here), salary information will not be necessary.

Task	Calculated Time	People Required	Estimated Cost for People	Materials Required	Estimated Cost for Resources
1. Get paint samples	1 hour	Sue, Joe	\$0	Car	\$10 (gas)
2. Choose a paint color	2 hours	Sue, Joe	\$0	Paint Samples	\$0
3. Remove all furniture	1 hour				
4. Take off trim	½ hour				
5. Paint trim	1 hour				
6. Apply first coat	2 hours				
7. Apply second coat	2 hours				
8. Put trim back in	½ hour				
9. Put all furniture back in	1 hour				





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## 42. Project Management Tools

ELLEN MATHEIN

### The Gantt Chart

Gantt charts have become a common technique for representing the phases and activities of a project work breakdown structure, as they can be understood by a wide audience.

A Gantt chart is a type of bar chart that illustrates a project schedule. Gantt charts illustrate the start and finish dates of each task, as well as task dependencies and links. Gantt charts can be easily customized to show resources, costs, and other important information. They can also be color-coded for different task phases or responsibilities.

Image result for gantt chart

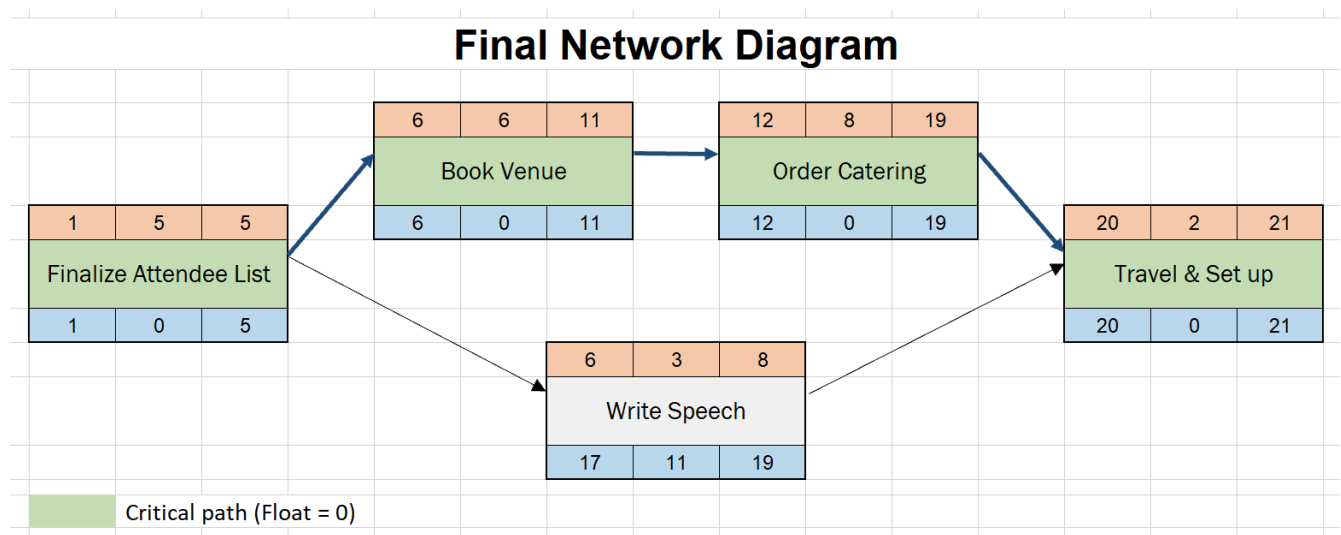
### The Network Diagram

A network diagram is another way of showing the path of tasks in the project. Tasks are each placed in a box and each box is placed in chronological order. Arrows are drawn from task to task, indicating the logical progression of work. Boxes can be customized to contain any information you like, including start and finish dates, task length, cost, resources, and more. Boxes can also be color-coded based on the phase of the project; resource required, team assignment, etc.

We recommend building the network diagram as a team using these steps.

1. Write all steps out on sticky notes.
2. Tape a large piece of paper to the wall.
3. Place sticky notes in order.
4. Once you think you have the right order, check to make sure lag and lead time is allowed for. Also look for ways that work can be completed simultaneously.
5. Draw arrows to indicate task links. Color-code the boxes if desired.
6. Post the diagram in a central location. Make a copy for reference, and keep the original drawing updated as the project progresses.

The network diagram will also help you identify the critical path: the shortest path through the project. This will help if an element of the triple constraint changes and you must alter your plan.



### Using a RACI Chart

A RACI chart is an excellent way to outline who is responsible for what during the project. To start, create a chart with tasks listed on the left hand side, and resources listed across the top. Now, put the appropriate letter in each cell:

- **R:** Responsible for execution
- **A:** Approver
- **C:** Consult
- **I:** Keep informed

---

#### Example

	Sue	Bob	Joe	Jane
Build widget plan	A	R	I	I
Build widget	R	A	C	I
Ship widget to customers	I	I	I	R

---

### Going the Extra Mile: Microsoft Project

Throughout the course, we have made some references to using computer software to manage projects. We have even included some diagrams from Microsoft Project, a popular project management application.

Applications like Microsoft Project are extremely useful for project managers and their teams. Microsoft Project, as an example, stores information about resources, schedules, tasks, budgets, and more; generates reports on the fly; allows you to enter and view information in numerous ways; and even allows you to collaborate with other team members.

We urge everyone, particularly new project managers, to remember that Microsoft Project is just a tool. In order to make the best use of it, you must understand how it calculates numbers and generates diagrams. Once you have a solid understanding of basic project management concepts, feel free to take the time to learn about project management software if you desire.

Remember, too, that every project requires different tools. For small projects, you may not need the sophisticated features of a software program. If you choose to grow your project management skills, however, and take on larger projects, you will appreciate the extra tools available in these applications.



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# 43. Executing the Project

ELLEN MATHEIN

## Establishing Baselines

There is actually one final task to complete before we can start work on our project. Establishing the baseline indicates the formal end of the planning phase and the beginning of project execution and control.

The baseline is your original plan, containing the original scope, cost, and time. This gives you a measuring stick throughout the project. For example, let's say that your baseline budget was \$20,000. If, after the first task, you have spent \$15,000, you know you're in trouble. You can then evaluate the situation and prepare an action plan – hopefully before things get too out of hand.

The baseline should be communicated to all stakeholders and the project team. Scope and resources can be outlined in text format. Cost and time can be displayed as a graph. Or, you can use a graphic scheduling tool (like a Gantt chart or network diagram) to display the original plan and track where you are.

## Monitoring Project Progress

As the project manager, it is your responsibility to monitor all the parts of your project to make sure they are continuing as planned. If issues arise, it is your responsibility to resolve them, or to escalate them to someone who can resolve them.

Some popular, effective methods of tracking project progress include:

- Regular status meetings
- Regular status reports
- Hands-on observation
- Recording data manually or electronically and generating reports (for example, spending to date versus total budget)

Your visual scheduling tools can also help you record project progress and communicate it to your team.

- As tasks are completed, they can be crossed off the Gantt chart and/or the network diagram.
- If new resources need to be added, they can be added to network diagram boxes.
- If tasks need to be re-scheduled, they can be moved around on the network diagram.
- Risks, accomplishments, and lessons learned can be posted next to tasks.

## Triple Constraint Reduction Methods

Be forewarned: after all of your planning, it is very likely that one element of the triple constraint will change. Perhaps a team member has left the organization, the budget has been cut, or new technical requirements need to be met.

When approached with scope changes, don't panic! There are three established methods that you can use to decide how to alter the course of the project.

- **Crashing:** Reduce the schedule without changing the budget, or vice-versa (depending on project needs). This can be done by using cheaper resources, or by re-evaluating time estimates.
- **Fast-Tracking:** Can be done with the schedule only. Looks at the schedule to see which tasks (if any) can be completed concurrently, and where lag/lead time can be reduced or eliminated.
- **De-scoping:** Removes items from the project scope to free up time and/or money.

Make sure that you truly look at the big picture, and include short and long term benefits and consequences in your decision-making process.

Once you have performed careful analysis, gather documentation to back up your decision, clear the decision with the appropriate stakeholders, change the project plan accordingly, and communicate the plan change to everyone involved.



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## 44. Tracking the Project

ELLEN MATHEIN

### Making the Most of Status Updates

Regular, mandatory status meetings for all project team members should be a part of any project. These meetings will give team members a chance to connect, discuss issues, and solve problems. It will also give you the opportunity to coach team members and make sure you're on top of what everyone is doing.

Status meetings should be tied in with status reports. We recommend that both items be completed weekly or bi-weekly, depending on your project. Also, remember that meetings and reports can be brief or detailed – it all depends on what level of control you need and how big the project is.

We recommend a Friday-Monday schedule, where reports are submitted on Friday (before the end of the day) and status meetings are held on Monday. If a holiday happens to occur, reports could be submitted on the Thursday, and meetings could take place on the Tuesday.

Status reports should contain the following items:

- Team member name
- Status report date
- Tasks planned for the previous week
- Tasks completed in the previous week
- Tasks planned for the following week
- Issues and risks identified (highlight those that require project manager attention)

Status meetings, then, are a review of tasks that each member completed for the previous week, what they have planned for the upcoming week, and what issues they have encountered or predict.

Again, status reports and meetings should be customized for your projects' needs. Team members should also know that issues should be reported to the project manager as they arise.

### Managing Change

Change management is another way of controlling your project. This process ensures that any changes, whether they are to the objectives, requirements, tasks, or design of a particular component, are approved by the project team.

At the beginning of the project, all stakeholders and team members must agree not to make any changes to the project plan or to the design of its components, and to instead follow a change management process. Then, when a change is required, a change management form is completed.

#### Example

Change Request Number:	Change Requested On:
Change Requested By:	Change Submitted By:
Change Details:	Tasks Affected:
Approved or Rejected?	By:

Then, the form is submitted to the project manager. The change is reviewed and a decision is made. In small projects, the review process may be done by the project manager. For larger projects, the project team or even a separate task force (typically called the Change Control Board, or CCB) is involved.

#### Monitoring Risks

Remember the risk management plan that we built during the planning phase? Make sure it doesn't stay on a shelf. Continue to monitor and add to it.

Here are some additional tips for making sure risks don't ruin your project:

- Be proactive. Have meetings with stakeholders and outside parties to ensure your risk assessment is accurate and that your action plan (if you have one) is valid.
- Keep an eye out for assumptions. Make sure that they continue to hold true. Identify what could happen if those assumptions are unfulfilled.
- Keep a record of what actions you take to mitigate risks.



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# 45. Closing the Project

ELLEN MATHEIN

## Preparing for Closeout

As your project winds down, you may find team morale dropping, or anxiety increasing. Closure of a project can be difficult, particularly if the project has been long and/or difficult, or if team members will not be working together afterward.

To help team members get through this tough time, make sure they know what they will be working on after the project. Make sure they know who will be reviewing their performance. (If it is not you, let them know that you will pass on information about their performance to their regular supervisor. This expectation should have been set at the beginning of the project, too.) Encourage team members to come to you with questions.

## Celebrating Successes

After the project, take time to celebrate the things that the project team did well. Try to recognize each person for their contributions and accomplishments.

Team celebrations, of course, are also an important part of project close-out. It is a great idea to have a team party. Another excellent idea is to have a close-out meeting with stakeholders, team members, and other interested parties. This provides an opportunity to review the project's accomplishments and challenges – and it ties in with our next topic.

## Learning from Project Challenges

No project will go perfectly. There will always be a risk you didn't anticipate, tasks that run longer than they should have, project team members that didn't perform as you expected... If it can happen, it probably will!

Meeting with team members and stakeholders to identify lessons learned throughout the project is a valuable exercise for several reasons.

- It ensures everyone is aware of the challenges encountered and what was done to resolve them.
- If something is learned from a mistake or failed endeavor, then the effort put into the task is not entirely wasted.
- Participants can apply these lessons to future projects and be more successful.
- Lessons learned should be documented and included with final project documentation.

## Scope Verification

Another important part of project closeout is scope verification. This is where stakeholders and team members meet to determine whether or not the project did what it set out to do.

This checklist can be used as a guide for scope verification.

- Were all needs met? Were any wants met?
- Were all SMART objectives achieved?
- Were all deliverables met?
- Are the stakeholders happy with the results? Are team members happy?

If the project team realizes that an important deliverable has been missed, there are two options.

- Return to the planning phase and create a plan for completing the missed tasks.
- Choose to leave this item as unmet and create a separate project for it.

## A Final To-Do List



In addition to scope verification and lessons learned, the following tasks should also be completed during closeout:

- Pass on appropriate project information (training documentation, blueprints, troubleshooting information, etc.) to the appropriate people.
- Ensure all payments have been made and paperwork submitted.
- Dispose of or return materials.

All project documents, both electronic and paper, should be completed and compiled. Make sure to include the original document, the final document, and any revised versions. Key documents include:

- Statement of work
- Project charter
- Project planning worksheet
- Project schedule and related documents
- Risk management plan
- Communication plan
- Change management requests
- Team member evaluations
- Lessons learned
- Meeting minutes
- Status reports



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