

# Foundations for Success

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## INTRODUCTION

*Operations management is best described when it is placed in the context in which it exists—the business. As we'll soon understand, operations management is necessary for the financial success of the business. To see how operations decisions affect financial performance, several foundation components that form the context of operations must be understood. These components are at the heart of the business itself.*

# Introduction: Why Operations Management?

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## LEARNING OBJECTIVES

- Describe the relationships among value, profitability, cost, processes, and capabilities.
- Describe the components of value.
- Differentiate between the resources that create value.
- Describe the changes in the business environment and the impact they have.
- Describe the external forces that can affect the business.
- Explain the differences between service and product outputs.
- Explain why B2B and B2C customers may define value differently.
- Describe how operations concepts will affect you in your field.



## AN ENGINE FOR THE NEW ECONOMY

Hundreds of businesses come and go every year. Some are barely noticed. Still others make such an impact that they actually seem to drive the economy. FedEx is one of those companies.

Fred Smith has transportation in his genes. While taking a course at Yale University, Smith wrote a paper on difficulties he expected businesses of the future to have because they would not be able to maintain inventories of computer parts for repairs and replacement. He proposed a logistics system that could transport those items door-to-door overnight. His idea wasn't looked on with favor, because at that time the air cargo industry was a sideline for airlines to use the empty space in the planes' bellies, but he never forgot it. After flying over 200 missions in Vietnam, Fred Smith returned and took over Arkansas Aviation in 1969. He founded Federal Express in 1971.

Smith's idea of using a hub-and-spoke system for deliveries was modeled after the way banks handle canceled checks. His initial desire, to set up the Federal Express headquarters in Little Rock, was turned down. Airport officials in Memphis were optimistic, however, and offered him the use of some empty National Guard hangars. The rest is history. Those hangars in Memphis turned into a \$28 billion business, with over 250,000 employees, a fleet of more than 1,300 planes, 90,000 vehicles, and deliveries to 220 countries.

In today's economy, rapid and dependable movement of goods allows the economy to function as it does. "Speed" is the most important attribute for business logistics needs. Reduced time results in faster turnaround for customers and a quicker return on financial investments. Dependability of delivery enables businesses to reduce levels of inventory because they can be certain goods will arrive when promised.

FedEx's impact on the New Economy continued when in 1994 it decided to give customers the ability to track their own shipments online. In the late 1990s, FedEx took another step by seeking state-of-the-art solutions for improving its services. By 2000 it had initiated Global Inventory Visibility System (GIVS®), which allows customers to view inventory anywhere. The growth of FedEx's capabilities enabled it to double its volume time and time again, until it reached 6 million packages per day in 2006.

With continued investments in information technology (IT), new shipping hubs, sorting technology, and ground and air transportation, FedEx not only contributes to the New Economy but can provide the engine that makes it work. It has developed these capabilities by effectively utilizing a unique set of resources, some of which include:

- Data centers that process more than 20 million transactions per day.
- Terminals at over 100,000 customer sites, proprietary software used by 650,000 customers.
- The largest digital network of any company in the world.
- An IT staff of more than 5,500 people.
- Its own staff of meteorologists.

As the New Economy drives companies to move faster and with greater flexibility, FedEx will very likely be leading the logistics field to make it happen.

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Source: <http://www.fedex.com>; "FedEx Keeps Delivering," *BusinessWeek*, April 26, 2002; Face Time with Fred Smith, *Fast Company*, June 2001, p. 64; *The Global Impacts of FedEx in the New Economy*, SRI International, <http://www.sri.com>, March 25, 2004; "The FedEx Edge," *Fortune*, April 3, 2006.

**O**perations management is the management of the resources a business uses to create value. Value creation from resources lies at the heart of all businesses—those that make consumer products, products for other businesses, or consumer or commercial services. Without resources management, value is never formed, products and services are never sold, there is no profit, and the business fails.

## Operations: The Heart of the Business

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**W**hat is operations management? Why is operations management a critical topic of business study? Operations management is the management of resources used to create salable products and services. It consists of those tasks necessary to turn business inputs into more valuable outputs. The inputs consist of the traditional business resources—employees, equipment, inventory, and facilities—combined with some not-so-traditional assets—knowledge, skills, customer relationships, and reputation. For an increasing number of firms, the resources include such things as Internet server speed and capacity, the technical acumen of staff, and bandwidth. The salable outputs are products, services, information, and experiences. The challenge of operations management is to manage these resources effectively to generate a positive financial return.

For decades, operations management has been described as a business function, analogous to accounting, marketing, and finance. To be fair, there's nothing inherently wrong with that statement. Many businesses have taken on a very different look in recent years. Business functions look different, too. Responsibilities have changed, decisions have changed, and the role of traditional business functions has changed. In many firms it has become difficult to distinguish between some of these functions. Despite the fact that marketing, engineering, and operations tasks are still accomplished, their role as distinct and independent functions has changed. Managers in all functions must interact and coordinate their decision-making processes.

While it is generally agreed upon that operations management consists of managing resources that create value, some of those resources extend to beyond the walls of a business. They include resources used to transport products from a supplier on to a customer, or to store products somewhere in between. The management of the interactions between businesses has come to be known by many businesses as supply chain management (SCM). It is difficult, if not impossible, to draw a line between what is supply chain management and what is operations management. Fortunately, it doesn't really need to be drawn. Supply chain activities are so dependent on operations activities and operations activities are so dependent on supply chain activities that they can't be realistically separated.

Many companies bring experts together into cross-functional teams rather than have them continue to function behind the barriers that have traditionally separated business functions. The teams change as each project is accomplished and as new ones arise. All team members must be cognizant, from a broad business perspective, of what has to be done and why. The isolated departments that once existed, sometimes referred to as "functional silos," have seen their walls disappear. The business where people interact only with their own kind—accountants, human resource managers, or information systems staff—is no longer effective.

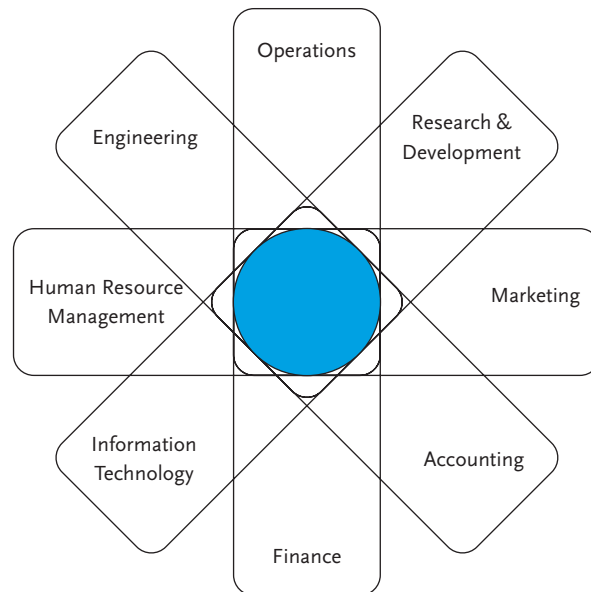
## Differentiate Yourself

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Put more simply, and from the perspective students must have for their future: Businesses want to hire bright people, trainable people, who can ultimately make decisions that are best for the business. They don't want employees who cannot grasp the big picture or

## Overlapping Functions in Enterprise Decision Making

## EXHIBIT 1.1



who cling to a belief that what looks best for marketing or finance is obviously the best decision for the entire business. The present and future manager must have functional expertise with an enterprise perspective.

If a student imagines herself as a marketing brand manager for a consumer products firm, a president of a bank, or a consultant, and assumes she will be working with people whose expertise and background are the same as hers, she should think again. She is placing constraints on her career potential. She'll work with systems experts. She'll work with engineers. She'll work with people whose expertise lies in areas that haven't even been thought of yet. She needs to understand what they do and why they do it. She needs to understand how her business converts resources and capabilities into a healthy profit. She needs to understand operations management.

Good managers are effective at solving problems in complex systems. They must understand cause and effect. A physician's role is an appropriate analogy. A physician who specializes in a particular aspect of human health, whether it be an endocrinologist, an orthopedist, a dermatologist, or a gastroenterologist, has to have an understanding of the entire body. If she doesn't, she won't be able to identify symptoms elsewhere that point to problems within her own area of specialty or the potential problems that can result from problems within her area of focus. She can't make the best decision for the endocrine system, the best decision for the skeletal system, the best decision for the skin, or the best decision for the gastric system. She has to make the best decision for the person.

Business functions do not act independently. The overlapping rectangles in Exhibit 1.1 illustrate how information sharing and decision making involve many functions and personnel with diverse expertise. A business is a system. No functional department can make a decision that doesn't affect the rest of the firm. The important decisions of the firm—those that have critical implications for its success—occur at the interface. The decision makers recognize the implications because they understand the business.

## Operations Management: How We Got Here

To understand the environment of operations management today, it helps to have a bit of an understanding of where it's been. In the late 1700s and early 1800s Europe, and

**craft production**

Production of goods by highly skilled and specialized artisans.

**mass production**

High-volume production of standardized products.

eventually the United States, was involved in the Industrial Revolution. During the Industrial Revolution, products were produced by individuals who had highly developed skills working with iron and wood. This type of production, known as **craft production**, was capable of producing high-quality products, but since products were produced individually, no two were exactly alike.

Since products were not exactly alike, repairs and replacement parts had to be custom produced. Producing products individually did not take advantage of the scale economies of producing in higher volumes. The concept of interchangeable parts was first introduced in the late 1700s, and the production of some products shifted from one-at-a-time to more efficient and economical volumes.

Managing work in a more sophisticated way was not introduced until the early 1900s, when Frederick W. Taylor promoted an approach that came to be known as scientific management. Scientific management embraces the idea that the best way for performing a task could be determined, and once determined, all workers should perform the task in that way. Others extended Taylor's theory.

Taylor's views radically changed manufacturing in the United States. High-volume production and standardized work methods evolved into the **mass production** that characterized U.S. manufacturing until well after World War II. As efforts to increase wartime production of goods reached a peak, various quantitative tools were developed to optimize production. These tools, which include linear programming, simulation, and other modeling approaches, began to see common usage for decision making.

Following World War II, several experts in process quality assisted Japan in its reconstruction efforts. These experts included Walter Shewhart and W. Edwards Deming. The work of Shewhart and Deming transformed the quality of Japanese products to the point where by the early 1980s Japanese auto imports were far superior to those manufactured in the United States. The quality deficiency of U.S. products relative to those of Japan triggered an increasing emphasis on quality in the United States. This quality revolution shifted to include other aspects of Japanese production known as just-in-time (JIT). The high-quality, low-inventory production systems have remained popular in U.S. manufacturing as proven ways of increasing value and reducing costs.

By the 1980s the U.S. economy had become more service oriented as manufacturing began to shift out of the United States toward countries with lower labor costs. Increasingly, through the 1980s and 1990s, services became a greater part of the U.S. economy.

**EXHIBIT 1.2****Contrasting Corporate Characteristics: 20th and 21st Century**

<b>Corporate Characteristic</b>	<b>20th Century (Old Economy)</b>	<b>21st Century (New Economy)</b>
Organization structure	Pyramid hierarchy	Network
Focus	Internal	Customer
Management style	Structured, rigid	Flexible
Market reach	Regional/national	Global
Productive resources	Physical assets	Information/knowledge
Production mode	Mass production	Mass customization
Production structure	Self-sufficiency	Network alliances
Inventories	Months of supply	Hours of supply
Production cycle time	Weeks/months	Days
Timeliness of information	Weekly	Real time
Product life cycle	Years	Months
Desired quality level	Affordable best	Perfection

Used with permission from SRI International.

By the late 1990s the Internet was realizing its potential to change the way businesses communicate with each other and with customers. As technologies for information sharing improved, businesses began to recognize the effects that individual decisions had on their suppliers and customers, and so was born the concept of supply chain management.

Today business embraces mass production in services and manufacturing, but technology is making inroads into the “holy grail”—mass customization. Products and services designed and delivered to meet an individual’s needs, quickly and at low cost, constitute the latest attainable goal. Corporate characteristics have changed substantially in the last century. These differences define the New Economy and are contrasted in Exhibit 1.2.

## The Future of Operations Management

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Service-oriented businesses, whether they are banks, retail stores, insurance companies, or hairdressers, have long recognized the customer as an integral part of the firm’s formula for success. The firm’s location, design, and layout, as well as the training of employees, have always had a customer focus. Manufacturers, on the other hand, have been able to isolate themselves from the consumer with barriers of distributors, wholesalers, and retailers. Now, however, even such hard-core manufacturers as auto producers have recognized that service-related issues are as important as—if not more important than—the product they sell.

All businesses received a wake-up call when personal computer (PC) manufacturers began to sell customized PCs directly to the public. That business model was immediately copied. Toyota, Ford, and General Motors are rapidly approaching the day when the customer will have the ability to configure a car over the Internet and climb behind the wheel in days, not weeks.<sup>1</sup> Internet speed forces a company to place the customer at the center of everything and design itself for customer satisfaction rather than mass production. Today’s definition of customer satisfaction extends beyond product quality to incorporate speed, flexibility, and other service-related issues.

It’s true that the Internet has not removed all the stumbling blocks to good customer service. We all still occasionally encounter products of poor quality. We encounter poor quality service, such as slow responses and long delays, much too frequently. Is this Internet speed? No, but it’s a great opportunity for a competitor wanting to increase market share.

United Parcel Service (UPS) has experienced the dramatic change in consumer expectations for customer service. In December 1995 it experienced its first month with 100,000 online tracking requests. In December 1996 it experienced its first month with 1 million online tracking requests. In December 1997 it experienced its first *week* with 1 million online tracking requests. In December 1998 it experienced its first *day* with 1 million online tracking requests. In December 1999 it experienced its first day with 2.5 million online tracking requests. In December 2000 it experienced its first day with 5 million online tracking requests. In five years the demand for that service grew by a factor of 1,500.<sup>2</sup>

It used to be easy to distinguish between manufacturers and services. Manufacturers made things you could get your hands around. Services fulfilled needs, but their outputs were intangible. Apple’s iPod and music download business has so intertwined the selling of products (MP3 players, accessories, songs, TV shows, and movies) and services (iTunes software and updates, iTunes music store, song reviews, podcasts, and playlists) that it will forever blur the lines between products and services.

Today all successful firms must deliver services. Companies *know* this. They even provide the mechanisms—customer service hotlines and Web sites with “Contact Us!” buttons. Automakers like Ford, GM, and Toyota thrive on the services they bundle with cars. Computer makers provide on-site repairs. These mechanisms can be effective, but for the business that doesn’t take them seriously, they can also be dangerous. Expectations increase because customers think the businesses mean what they say. Unfortunately, many companies don’t know how to follow through on their implied promises. They raise the customers’ hopes and then dash them.



Today's managers must be committed to continuous learning to remain current and aware of advancements made in their area of expertise and in other areas of the business. As the cross-functional and global characteristics of business become more important, an enterprise perspective, enhanced by ongoing educational efforts, is critical.



Many traditional manufacturing firms, including automobile manufacturers, computer manufacturers, and other consumer product manufacturers, no longer manufacture at all; they'll merely assemble components provided by a deep network of suppliers. Some don't even assemble, but invest their expertise in product development and look outside the company for manufacturing capability. In fact, the notion of vertical integration is beginning to take on a new look. In the past, manufacturers were likely to buy up suppliers in order to have better control over quality and costs. They were disconnected from the consumer by distributors and independent retailers.

The pendulum has now swung the other way. Manufacturers are outsourcing more of their needs and at the same time becoming more directly linked to the customer through services. Even Japanese manufacturers, despite decades of close-knit supplier networks, have begun to outsource manufacturing processes to contract manufacturers.<sup>3</sup> These changes are made possible by advancements in technology that enable firms to maintain accurate and almost instantaneous communication between customers and suppliers.

Computers quickly process information over the Internet, but how can the actual physical systems move goods and services so fast? In the current business environment, speed is critical. How can an order for a customized automobile be completed in five days when many of us can't get a response from an e-mail in 48 hours? How are many businesses able to react that quickly and why can't they all? How can machines produce products so swiftly? How can products be moved that rapidly? The answers are that the processes must not only accomplish their objectives quickly but also be designed for almost split-second response to change. Suppliers must provide instantaneous replenishment, and production processes must be totally flexible. Services must meet customer needs immediately. They must know in advance what individual customers want.

## An Economy Based on Knowledge —

The world economy itself is changing drastically, and businesses must exist within that changing environment. We often hear reference to a "knowledge-based" economy: What does that mean? And, more to the point, "So what?" In a knowledge-based economy, innovations substitute knowledge for other capital. Some creative person comes up with a great idea, and suddenly some other product or service is obsolete. Someone gets

rich, and someone else is looking for a new job. But more important, we, as a society, gain knowledge. Knowledge breeds more knowledge. Just imagine the ideas and wealth that have been dependent on the development of the first Web browser created by graduate students at the University of Illinois. The World Wide Web wasn't their idea. Their creative input was in developing a different way to use it. The creativity that sparks innovation is often the ability to recognize another use or potential for someone else's idea.

Knowledge expands at an even faster rate when more people talk to each other and share ideas. This principle has expanded to create a global business network—enhanced even more by close relationships between companies that trade with each other to the point that they invest in each other, help develop each other's new products and services, and help each other solve problems. These strategic alliances have created a new business environment.

Rapid change, driven by technology and expanding global markets, has changed the way we make business decisions, the way we value assets, and the way we calculate costs. The traditional understanding of value and how customers perceive it has been turned inside out. For a while, even the way people thought about profit changed. Market share was the only important measure. Profit didn't matter. Just ask shareholders of "pavingstones.com" or "petfoodinbulk.com." No one should be surprised that consumers would not pay \$13 plus \$7 shipping for a \$15 bag of dog food. That was then. This is now. Profitability matters.

## A New Business Environment

Businesses today range from a traditional manufacturer of corrugated paper containers (cardboard boxes to you and me), such as General Packaging Corporation, to one running an online auction of banner space on Web pages, like WebmasterBids. Imagine selling, through a virtual auction, a virtual commodity (Web page advertising space) that may even be purchased by companies wishing to advertise their virtual services. Boxes are traditional products that have been around for years and will be needed for years to come. Both have value. Imagine selling either of those "products" anywhere in the world and purchasing materials, information, and employee talent from anywhere in the world as well.

Virtual products and services that are now commonplace could barely be imagined 10 years ago. An online auction of *anything* would have seemed unlikely. An auction of advertising banner space on Web sites would have seemed ridiculous. Will online auctions

### om ADVANTAGE

#### PayPal: The Worst Idea of the Year?

PayPal, the largest Internet payment network, allows money to be sent by e-mail. It has dominated the auction company Ebay as a safe and convenient way to transfer money from buyer to seller. It has a customer base of 10 million and has grown rapidly. It expects \$3 billion in transactions per year. Surprisingly, PayPal didn't start out with that concept in mind at all. Originally, PayPal started in 1998 as a specialized service for owners of Palm computers who needed to transmit funds to each other using the device's infrared port. In its early days, however, to actually use the feature the two Palm users had to be so close they could have easily handed checks to each other. One trade publication voted the idea the worst of the year. PayPal also provided a means for non-PayPal users to transfer money, and it was this capability that began to become popular. The Palm-only service was

dumped and PayPal began to grow. PayPal is expanding its position to be the online means of transferring money for all types of online business transactions, including traditional bills like phone and utility bills. PayPal has 40 million account members worldwide in 38 countries.

PayPal's success lies in the fact that it doesn't try to reinvent everything. It recognizes what needs to be reinvented and does that quickly. The rest PayPal leaves alone. PayPal has been particularly attractive to small merchants, which can be charged as much as 5 percent by credit card companies. PayPal charges only 2.9 percent plus 30 cents per transaction.

Source: "Fix It and They Will Come," *Wall Street Journal*, February 12, 2001, p. R4; [www.paypal.com](http://www.paypal.com), March 23, 2004; "These Guys Will Make You Pay," *Fast Company*, November 2001, online edition.

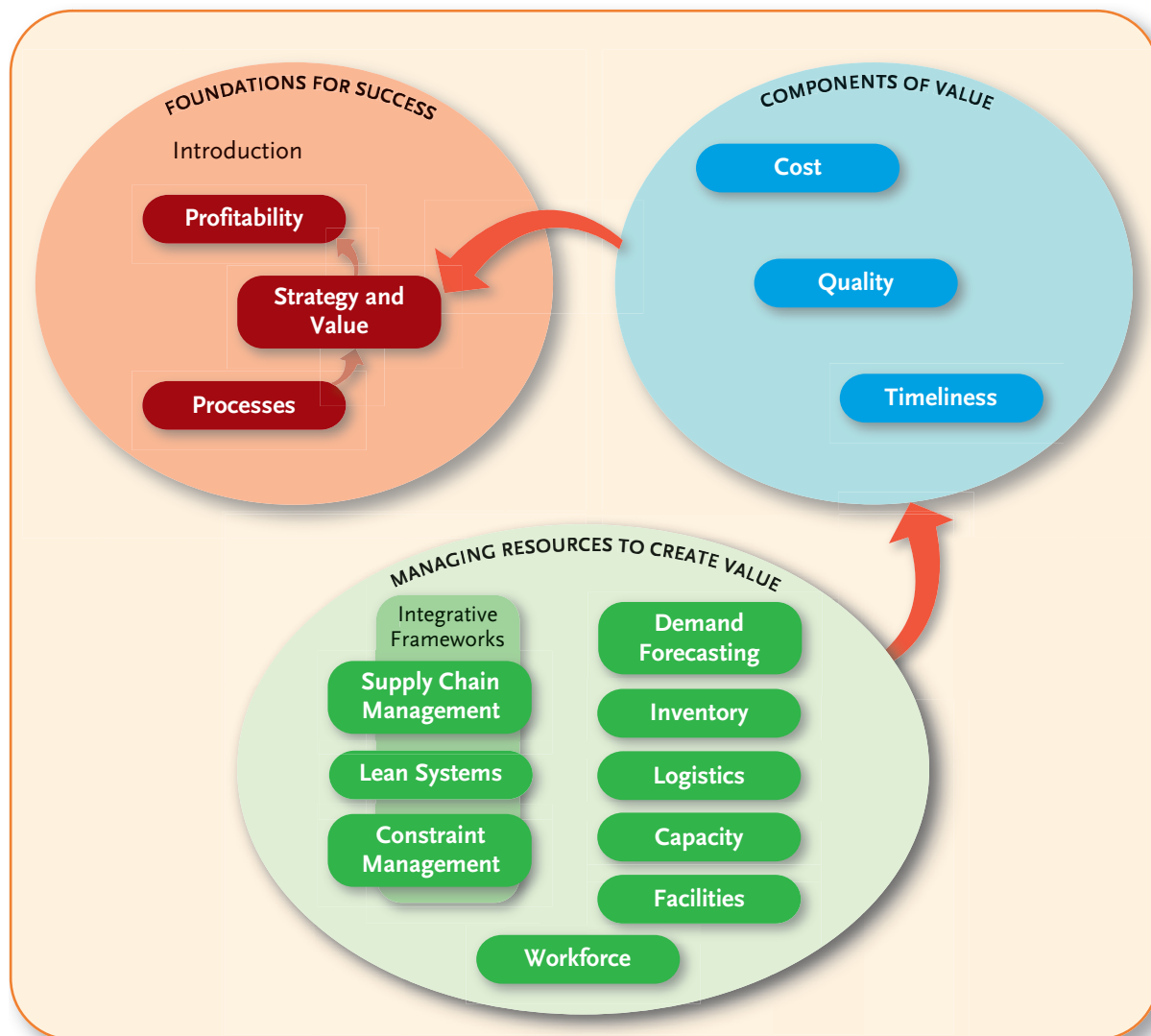
exist in 10 years? That's hard to say. You can bet, however, that we'll still be using cardboard boxes.

In addition to the added pressures and capabilities resulting from technological progress, many other pressures exert forces on business. Pressures vary in different industries, but globalization of businesses is a prominent issue for many. As businesses increasingly expand to international markets, increase their use of product and service suppliers from around the world, and form alliances and relationships with businesses from other countries, the U.S. business landscape disappears. "Market share" as defined by the percentage of the U.S. market a company has is meaningless.

The vast range of products and services makes it impossible to come up with a general model that perfectly represents operations in all businesses. A model is important, however, to understand operations and its role in businesses. An effective model helps relate operations activities to business goals. Such a model is critical if operations concepts are to be integrated into the firm's success, and not treated as independent entities. The Resource/Profit Model, shown in Exhibit 1.3, provides a framework for placing operations management in the larger business context.

## EXHIBIT 1.3

## Resource/Profit Model



The elements in the model are parallel to the chapters in this text. The purpose of the model is to identify how topics relate; it doesn't limit the sequence of coverage of chapters to the order in the model.

## Operations Management in the Business

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### Foundations for Success

The Resource/Profit Model begins, quite logically, with the overriding objective of the business—profitability—and proceeds with two of its most critical prerequisites—strategy and processes. These concepts are presented in Exhibit 1.3 as “foundations for success” because they form the foundation for decision making throughout the business. It is no coincidence that there are parallels between finance classes and the coverage of profitability, as it relates to operations management, in this book. This connection is critical because finance exists in the environment of operations management decisions. Operations management, on the other hand, exists within an environment of financial decision making. It is also no coincidence that the coverage of strategy will link closely to concepts in marketing. Strategy is a plan for creating value and is an important operations management responsibility. Determining what customers value, however, is at the root of marketing responsibility.

#### Profitability

Every business organizes resources into processes and uses these processes to create goods and/or services to sell. Ideally, the sale results in a positive financial return on the investments that were utilized to create the goods and services. **Profitability** is the primary objective of any business. It is the answer to the question “Why?” when asked about the existence of any business.

The goal of a business is profitability, not profit. When most people say “profit,” they really mean “net income,” but net income doesn't provide enough information to measure a business's success. It's simply the measure of an output. If a business's net income was \$100,000, it's impossible to know whether it was successful. Profitability measures compare outputs to inputs to determine how productive the investment is. A successful business strives for long-term profitability. That requires staying power, growing market share, and, most of all, treating customers well.

Businesses have other objectives, including employment and development of individuals and contributing to society as a whole, but none can be accomplished without profitability. Financial return, short and long term, at a rate that is greater than other alternatives must be at the forefront or all other objectives will fail when the company folds. Operations management is at the heart of that cycle, managing the productive resources to provide profitability.

#### Strategy

The goal of any investor is to find an investment that will create **value** for the owner. Resources are company assets that are expected to provide a financial benefit to the owner. If the answer to the “Why?” question of a business's existence is profitability, then the answer to the “How?” question is value. You bought the shoes you're wearing because you thought they were a better value than other alternatives. You prefer one restaurant to another because of how you define value. The difference between the perceived benefits and the perceived costs establish the customer perception of value.

Customers are willing to pay for value, and therein lies the potential for the business's owners to benefit from their investment. The difference between the amount customers are willing to pay for something and the cost of creating it provides the opportunity for profitability.

Changes in pricing approaches have dramatically changed the way customers must determine value. As businesses gather more data about customers' purchasing habits,

#### profitability

A measure of the productivity of money invested in a business, typically a ratio of net income to some input such as net sales or total assets.

#### value

The amount a customer is willing to pay for a product or service, sometimes thought of as benefits divided by cost.

they are setting different prices for different individuals. This has been a standard practice for airlines, hotels, and car rental companies. In mortgage lending, different interest rates are applied for different risks. This is actually advantageous for some, because they would pay an even higher rate elsewhere. Grocery stores have followed, offering reduced prices automatically for customers who normally buy certain products only during promotions or with coupons.

A business must identify how it will continue to add value to its inputs in ways that customers will desire. What type of customer will the business seek to attract? What will customers want? What will competitors do to meet customer wants? What must a business do to compete against them? A business must determine how it can create value as its environment changes and as customer desires change. The business must plan its **strategy**, which sets the direction for the future. The strategy is the way of offering value to a specific set of customers and is the means by which the company positions itself for future profitability. By establishing goals for the future, and creating the mechanisms to reach them, the business is able to adapt to changing customer expectations and changing environmental pressures.

### strategy

The means by which a company positions itself for future profitability.

### capabilities

The abilities a business has that result from its processes. Capabilities create value.



FedEx can deliver pallets of freight weighing from 151 pounds to 2,200 pounds to any U.S. location in one to three business days.

### processes

Organized tasks accomplished by grouping resources together.

The **capabilities** the company has formulated are the answer to the customer's questions "What exactly can you do for me?" and "What is it that I'm paying for?" The answer to those questions can be, simply, "This company can sell you a collar for your dog cheaper than anyone else." Or it can be "This company can offer you a selection of 50 different dog collars on our Web site. Our Web site is easy to navigate and quick to download. Purchasing products on the site is simple, secure, and quick. We can deliver your collar in 48 hours at a price lower than anyone else." Are the capabilities that enable a company to make such claims valuable? Certainly. Are they important parts of its strategy? Definitely.

### Processes

Capabilities are the direct outcome of processes. Processes are made up of activities. Activities are specifically designed to contribute to a product or service in a way that will be valuable to a customer. The grouping of simple activities into processes, and the grouping of processes in a way that creates capabilities, is at the core of creating value. One might argue that—unlike capabilities—processes are not viewed by customers as important. This argument may be true for product-oriented processes, because customers aren't as concerned about how a product is produced. However, customers care very much about the **processes** they must interact with to purchase that product. They care about service-oriented processes, such as those they interact with to get assistance when they need it. Customers care deeply about those business processes that affect them directly.

Processes and capabilities are a responsibility of operations management. They range from being extremely simple to extremely complex. For some businesses, the need for consistency mandates that processes be standardized and accurately documented. For others, the need for customization requires processes to be flexible in order to satisfy each

## TARGETING technology

### Eliminating Customer Risk-Taking at Borders

We've all considered purchasing a CD when we're not entirely sure we'll like it. Maybe we've heard a song or two but hate to shell out \$18 for one that will never be played. Some stores have dealt with that problem by offering to open any CD that a customer wishes to listen to. This satisfies the customer but creates logistical issues for the store trying to deal with all of those opened CDs. Technological advancements have enabled Borders to eliminate that dilemma for its customers in a much more elegant way. In the past, Borders had

listening carrels and a selection of several CDs to choose from. Using new technology, a customer can scan the bar code of any CD, which remains unopened, and the entire contents of the CD can be played. With this capability, risk is eliminated for the customer through unlimited preview options that are available. For Borders, CDs need not be opened for a customer to listen to them, but customers are able to sample everything offered.



Unique products or services depend on the business's ability to create capabilities that are distinctive. Entrepreneurs have responded to Bangkok, Thailand's air pollution problem with oxygen bars. In this bar, named "O2O," curious Thais and foreign tourists pay 90 baht (US\$1.80) for 20 minutes of oxygen. The ability to add oxygen to other services a business offers requires an investment in sophisticated equipment, facilities in a high-traffic location, current and interesting reading material for a broad range of interests, and personalized music selection.

customer's special needs. Processes range tremendously, from the method that McDonald's uses to ensure that a small paper bag is full of french fries, to the steps taken when KPMG audits a Fortune 500 firm's books, to how a credit card account number is transferred securely online by L.L. Bean. Most firms utilize a variety of processes that create capabilities of interest to customers. Often these capabilities set one firm apart from another. If the customer wants what the business capability provides, the processes have created value. For someone trying to make money in the stock market, investment decisions ultimately determine the return on the dollars invested. Make a good decision—get a good return. Make a poor decision—get a poor return. For product- and service-oriented businesses, processes act in a manner similar to that of a stock fund manager. Processes define how resources are used. If resources are used well, the return will be good. Processes play two critical roles in defining the financial return of a resource investment. First, the lower the cost (as long as value remains the same), the greater the difference between cost and market value. Second, the process is a major factor in the customer's perceived value. The more value added by the process, the greater the difference between market value and cost (as long as cost remains the same). Processes define the way resources are used through design, implementation, and use.

## Components of Value

The capabilities made possible through the effective development and management of processes create the services and products customers value. That value is the result of the interactions among three components of value—**cost**, **quality**, and **timeliness**—influenced by operations decisions and shown in Exhibit 1.3.

### Cost

When a customer orders a pizza, he is thinking about the taste of the pizza. When the manager of the pizza restaurant orders flour, she is concerned about the flour, but other aspects of the business transaction also affect the value of the dough. The first is the cost

### cost

The expenses associated with ownership.

### quality

Meeting customer expectations.

### timeliness

The speed at which a business completes tasks and the degree to which it completes tasks on schedule and as promised.

associated with obtaining the product or service. Cost can be defined as the amount of scarce resources consumed to achieve a specified objective. The cost of owning a new car, for example, is not just the price one has to pay to drive it off the dealer's lot. The total cost of owning it includes all costs associated with it over a specified period of time. If the customer wishes to own the car for six years, for example, the cost includes expenditures over that time period. Certainly, the price paid is part of the total cost, but so is the interest on the loan, the price of insurance, the cost of maintenance and repair, and the value depreciation on the car over the six years.

Costs can have very different meanings to different customers. In the previous example, the customer was assumed to be a consumer. A business customer might have a very different view of cost. A Toyota dealer, for example, would view the cost of purchasing a car as more of a financial investment. The total costs would include the cost of the space it would take on the lot, work that would need to be done on the car to get it ready to sell, administrative costs associated with ownership transfer, advertisement costs, and opportunity cost of the dollars invested in it that could be used for something else.

Processes cost money to operate. Resources cost money to maintain. The costs of employee time, materials consumed, and electricity are passed on to the customer and contribute to her costs as well. Cost is a critical component of value and an important criterion for many operations decisions.

### Quality

The quality of the product or service is another component of its value. For virtually any product or service, different levels of quality exist. Why? Because customers view quality very differently. What's high quality for one customer is not important for another. Higher levels of quality don't always translate into higher levels of value. Remember, value is in the eye of the beholder. Quality has very different meanings when products are compared to services. As mentioned earlier, outcomes dominate the customer's perception of value *and* quality when products are considered. For consumers, quality is often judged by how well the product met the customer's expectations. Did the product last as long as it should have? In other words, was it durable? Was it reliable? Did it do what it was designed to do? However, as soon as services are examined, the concept of quality becomes broader and more difficult to define. Were the employees friendly? Was the service quick? Did I have to wait in line long? The answers to each of these questions can be different for different customers. No matter what the customer's definition, however, the perception of quality will be a major determinant of value.

### Timeliness

The third component of value consists of the timeliness associated with the product's or service's creation, delivery, and availability. Something *now* is generally perceived as more valuable than the same thing *later*. Timeliness is often less critical for consumers than it is for business customers, but enhances value for both. Timeliness is often lumped together with quality when services are evaluated. When products are evaluated, particularly those purchased by a business, the product quality is certainly important, but issues of timeliness can be equally or even more important. For a business, time has a critical role in determining financial return on any investment. Achieving timeliness goals involves scheduling activities and processes so that process times can be minimized or due date promises can be met.

## Managing Resources Used to Create Value

Resources provide the direct inputs that either are converted into salable goods and services or enable that conversion to happen. As presented in Exhibit 1.3, among the most important resource management topics are inventory, logistics, capacity, facilities, and workforce. They provide critical inputs to creating the products and services customers seek. Operations, although critical in the creation of value, can't claim responsibility for all value added. There are other important resources as well, such as intangibles like

patents that result from the creativity of engineers and research and development specialists. Employee knowledge and skills—instilled in the workforce through training and development—and the creativity that emerges with the help of the business culture are also important. The communication networks that provide management with the data needed to make timely and appropriate decisions are also essential to the success of the business. This large pool of resources is tapped to provide capabilities that can differentiate a business from its competition.

The effective management of inventory, logistics, capacity, facilities, and workforce requires an understanding of the decision-making processes associated with those resources. As businesses have integrated business functions, however, that is not enough. In the last two decades, several **integrative management frameworks** have changed the way resource decisions are made. Supply chain management (SCM), the most recent integrative framework, recognizes that resource decisions within one business affect outcomes of customers and suppliers. SCM extends the realm of decision making beyond the business's walls and considers effects up and down the supply chain. **Lean systems** have evolved from the just-in-time (JIT) movement of the 1980s and focus on waste reduction in all its forms, but particularly emphasizing leanness in inventory and capacity. **Constraint management** takes a system view of how one limiting resource can reduce system productivity in a manner similar to the weakest link in a chain. Constraint management focuses on capacity-related resources, but has implications for inventory and workforce as well.

Integrative management frameworks provide a set of principles that eliminate the need to evaluate day-to-day decisions on the basis of profitability. They are, in a sense, an intermediate standard on which to evaluate decisions. A good analogy would be the way different basketball, football, and hockey teams identify a particular offensive or defensive *system* to run. The system provides guidance for players' actions, no matter what the opposing team does. Each system comes with a general objective and a specific set of rules of behavior that, if implemented effectively, should result in the team being able to compete. Different systems emphasize a different approach to utilizing resources (player talent or capabilities). One system might be used if a team is extremely fast but not very tall. Another system might be more effective if the team has two very tall players but no outside shooters. Integrative management frameworks are similar in that each has a general objective, each comes with a set of techniques or tools, and each focuses on specific resources.

The rise of integrative management frameworks has been interesting to observe. In virtually every case, they have been born out of the need to adapt to changing external forces. Each has become very popular, creating a frenzy to learn and adopt the system, as well as charge countless billable hours for consulting firms. Each has been labeled a “new philosophy of management.” Some have gained an almost cultlike following. And then each has declined in popularity—not because managers no longer believe in their value, but because they have been absorbed into mainstream management practice. They become such a part of good management practices that they are no longer viewed as a distinctive way of doing things.

### Supply Chain Management

Supply chain management focuses on the relationships among customers and suppliers, recognizing that the effects of decisions aren't limited to the business that made them but extend to suppliers and customers as well. Ultimately, the entire supply chain creates the value a customer perceives and receives. Optimizing that value and minimizing its costs require a decision-making perspective that includes the entire supply chain.

The integrative management frameworks tie together the foundations for success, the components of value, and the resources used to create value in a consistent set of decision-making priorities. Managers familiar with the objectives and the techniques inherent in each framework are provided with a systematic approach to decision making that will be consistent with global performance measures. Each provides a means of making day-to-day decisions consistent with the firm's profitability goals.

### integrative management framework

A management approach or “philosophy” that guides day-to-day decisions in a way that is consistent with a firm's profitability goals. Examples include lean systems, constraint management, and supply chain management.

### lean systems

A productive system that functions with little waste or excess, usually with low inventory levels.

### constraint management

A framework for managing the constraints of a system in a way that maximizes the system's accomplishment of its goals.



### Demand Forecasting

Simply owning inventory, capacity, and facilities, and paying a workforce does not result in the production of goods and services or the creation of value. These resources must be brought together into processes that provide the firm with capabilities. The firm's level of success or failure will be determined not by what resources the company owns, but by how it uses them. Resources aren't free, so the business must possess them in the appropriate quantity and at the appropriate time. If a company has invested in too many resources, those resources won't contribute to value. If the firm has too few resources, it can't meet demand. If the resources arrive too early, they aren't used. If they arrive too late, customer needs aren't met. Effective resource planning depends on an accurate forecast of demand. The demand forecast gives managers the basis upon which to order more inventory, identify more transportation or storage facilities, add to capacity, expand facilities, or increase the workforce.

### Lean Systems

Lean systems' primary focus is on the elimination of waste in producing goods and services. It is frequently used to eliminate waste related to inventory, processes, and the workforce, and it is also used when inventory reduction is desired. Just-in-time (JIT) management has been implemented in the United States since about 1980 after being practiced in Japan since the 1960s. Efforts to maintain lean systems utilize a variety of techniques and approaches to minimize inventory and increase flexibility of capacity.

### Constraint Management

Constraint management, also known as the theory of constraints, first attained visibility around 1987. It focuses on the role constraints play in an organization and how best to manage those constraints. Its goal is to increase the productivity of the system as a whole by focusing on its constraints and recognizing that optimizing specific parts of the system will not optimize the entire system. The role a constraint plays is often misunderstood. Its impact is so critical to system productivity that a better understanding can affect such wide-ranging issues as investment decisions, product and service pricing, and inventory levels.

### Inventory

A retailer performs what appears to be a simple function—selling products to consumers. It's easy to assume that the products, or **inventory**, would be one of its most important resources. The retailer must have it when the customer needs it, or sales are lost. To produce the product being sold, a manufacturer needs raw materials, which are used to create component parts, which in turn are assembled into finished products and sold to the retailer. All forms of materials make up a category of resources known as inventory, which serves many critical functions. It buffers one work center from direct dependency on another. It allows customers to be satisfied immediately. It enables retailers to offer their customers many choices. It is an asset on the balance sheet, but it is widely recognized by managers as a liability as well. Despite all of its benefits, surplus inventory has been blamed for many business failures. A resource that, when in either short supply or excess, can destroy a business must be managed with extreme care.

### Logistics

**Logistics** consists of managing the flow and storage of goods and services. It adds value by ensuring that the products and services are *where* they need to be. It contributes to timeliness because the movement of goods is often more time consuming than their production. It is intertwined with inventory management because effective inventory management extends beyond simply managing inventory within the business. The increasing dependency on outsourcing requires effective management of inventory *between* businesses as well. Logistics is a critical component of supply chain management because of increased competition, globalization, and technological advancements, and to increase the value offered to consumers. Effective logistics management reduces costs and increases value.

#### inventory

Materials used in the production of products and services. Examples include raw materials inventory, work-in-process inventory, and finished goods inventory.

#### logistics

The flow and storage of goods, services, and related information from production to consumption.

## Capacity

**Capacity** can be summed up as the level of productive output of an organization in a specified period of time. Productive output results from a variety of resources, but in most cases it is dominated by the availability of labor and/or equipment. H&R Block's ability to meet its demand is dictated by the number of skilled employees who can complete the IRS forms. Bank of America's ability to keep up with demand at a drive-up service is determined by the number of drive-up bays and tellers. A Target store's ability to keep pace with customers making their purchases is determined by the number of cash registers and operators.

One similarity should stand out in each of the above examples. Capacity is almost always expressed as an average. Why? Because the time required per unit can vary. In some cases that variability is a function of what's required. One person's income taxes are more complex than another's. Drive-up banking customers have different needs. In other cases, the employee or equipment varies in its ability to complete the required tasks. One particular accountant is faster in the morning and slower in the late afternoon. Ultimately, the management of capacity is to match output to demand. Excess capacity results in a financial return on those resources that is lower than that desired. A shortage of capacity results in an inability to meet demand.

## Facilities

The land and the building that houses a business can be the least important decision for management, as in the case of where to place a Web server, or it can be the most important decision, as when a retailer is determining store location. In addition to facility location, **facility** decisions also include how the facility should be arranged, or its layout. The facility layout often determines the business's ability to meet customer expectations. It dictates such outcomes as the ability to customize products and services, the ability to produce in high volumes, and the type of skills needed from employees. In many businesses, the layout determines the ease with which employees can interact with each other and with customers.

Every business has to be somewhere. The location decision makes that determination. Within that facility, every thing and every person also has to be somewhere. Where they are matters. The layout dictates possible processes and capabilities, as well as the costs, the quality, and the timeliness.

## Workforce

Most managers will claim that the **workforce** is their business's most critical resource. Inventory can be purchased, capacity can be purchased, facilities can be purchased, but good, talented, skilled employees are not easy to come by. They are developed, over a long period of time and at great expense. They are also the only resource that can leave the business for a better offer elsewhere.

Employees' skills, talents, experiences, attitudes, and backgrounds range tremendously. The diversity adds to the potential capabilities of the firm and also adds to the skills necessary at the managerial level. Great potential isn't free. The diversity of ideas, the creativity, and the ability to recognize potential value can come only from the widest possible set of experiences. The result of this diversity is truly any business's most valuable resource, but it is also one of the most difficult to manage.

## Environmental Forces

A business is an open system. No business that has an impact on external entities (customers, demand, and so on) can function without itself being influenced by external forces. The forces that exist within a particular business's environment often depend on competitive and regulatory forces within the industry, but there are also many environmental forces that cross industry boundaries.

## Globalization

The first and probably the strongest environmental force that product- and service-oriented firms must cope with is the increased competition and emerging markets resulting from

### capacity

The level of productive output of an organization in a specified period of time.

### facilities

The buildings and structures that house various aspects of a business.

### workforce

The employees required to produce a product or service.



FedEx started its Asian Pacific Operations in 1984 and now employs more than 9,700 people in more than 30 APAC countries and territories.

the globalization of most businesses. This phenomenon has resulted in increased competitive pressures in a firm's home country and increased opportunities in foreign markets. This trend will have a negative impact on firms unable to mobilize and seek new markets, but firms wishing to expand their markets will perceive this as a wide-open field in which they can excel. However, it's important to remember that along with expansion into emerging markets comes risk associated with political unrest, unknown competitive forces in those markets, unexpected expectation for products and services, and uncertainties associated with transportation, supplies, labor, and financial exchange rates.

The globalization of business has substantial effects on operations. Moving into global markets with products and services creates new definitions of value. As value changes, so does the creation of value, and so do requirements for processes and capabilities as well as cost, quality, and timeliness. It creates new objectives, but it also creates new challenges. Geographic distances translate into time differences, creating an entirely new set of challenges for managing all resources.

In addition to moving into global markets with products and services, businesses also move readily into global markets for purchasing products and services they need. Extending the supply base into global markets creates a new set of advantages and management challenges as well. Time necessary to obtain inputs increases. Infrastructures must be built. Employees must be trained. Along with these challenges come advantages. New ideas are generated. New skills and talents are identified. Extending the supplier base sometimes involves extending the location of facilities into foreign countries to take advantage of resources, talents, and markets. All of these decisions affect the way resources are obtained, utilized, and brought together in the value-creation process. They provide great potential, but they require managers to recognize the diversity of cultures and the talent, creativity, and views those cultures bring as well.

## The Internet and Other Technologies

The second environmental force being felt by most businesses is coming from the increased levels of communication and competition brought about by technologies. One of these technologies, the Internet, has created a business environment that makes geography a

### om ADVANTAGE

#### A Different Type of Environmental Pressure

Few changes in consumer behavior have had the industry impact of the low-carbohydrate, high-protein diet trend. As eating preferences of millions of people have shifted away from sugars, soft drinks, bread, and other high-carbohydrate staples, restaurants and food producers have had to adapt or be left with dwindling demand.

For some food producers, particularly producers of high-carbohydrate products like bread, demand has dropped off. Other businesses have been able to adapt. Restaurants jumping on the bandwagon range from Burger King and Hardee's bunless hamburgers to menu items at Chili's, T.G.I. Friday's, Ruby Tuesday, and many more.

To counter the slump in demand for some producers, the shift in eating habits has created some opportunities as well. Low-carb muffins, low-carb bread, and low-carb cereal

are common in special low-carb sections of some grocery stores. "Pizza in a bucket" has all the toppings, but no crust. Soft drinks and snack foods have been the victims of decreasing demand. Beer producers have felt the pinch and Michelob's Ultra Brew uses an extended mashing process to reduce carbohydrates to 2.6 grams (regular Michelob has 13.3 grams). A new artificial sweetener, Splenda (made by Johnson & Johnson), has had increasing demands since 2003. The diet has had indirect effects on product demands as well. High-protein foods have little fiber, so laxative demand has increased.

Source: "Health," *Fortune*, March 31, 2004; "PepsiCo: Getting into Niches," *BusinessWeek Online*, April 5, 2004; "Mania over Atkins Diet Growing Still," *Washington Daily News*, March 31, 2004.

nonissue for many firms. Businesses that were successful simply because of their location must develop other capabilities to maintain a competitive advantage.

The Internet has also placed a tremendous amount of pressure on businesses that act primarily as intermediaries between the producer and consumer. Manufacturers can deal directly with consumers, and do so at low cost. Intermediaries are finding it difficult to add enough value to warrant their markup. This phenomenon is not limited to product-oriented firms. Banks, investment houses, insurance companies, and numerous types of retailers must compete against firms that exist solely online, with no expenses tied to brick and mortar facilities.

Other technologies create environmental pressures as well. Geographic information systems (GIS), for example, have merged database technology and mapping technology to create new capabilities in location planning. Global positioning system (GPS) technology has enhanced our abilities to locate shipments precisely. Radio frequency identification (RFID) has the potential to enable businesses to track inventory through the supply chain and evaluate and count the contents of containers and trucks without opening them. These technologies and others enhance the information manager's capabilities, but can enhance the capabilities of competitors as well.

**Disruptive technologies**, as they have become known, wreak havoc and create opportunities. Napster, for example, turned the recording industry upside down. That same technology has enhanced collaboration efforts for many businesses. General Motors uses E-vis. IBM uses E-workplace. As more disruptive technologies emerge, managers adapt or watch as their competition takes advantage of new capabilities. Not surprisingly, the product that is the newest disrupter may, in a year or so, be the target of new disrupters.

## The Natural Environment

Changes in the natural environment constitute a third force exerting pressures on businesses. Air and water pollution are still a vital concern, even though the "point-source" origin of these pollutants is no longer the most significant source. Automobiles and homes have become the most significant threat to the health of our air and water. Greenhouse gas levels have raised global warming concerns. Household consumption levels threaten to overflow landfills, endanger drinking water supplies, and fuel a demand for agricultural products that may cause deforestation half a world away. Businesses now assess



FedEx Ground scans each package 14 to 16 times as it moves through delivery points.



FedEx's annual technology budget is \$1 billion.

### disruptive technology

A new technology that displaces an existing technology.



Environmental impact from businesses is probably impossible to eliminate completely, but progressive businesses have begun to include their potential impact and its costs in their decision making.

## om ADVANTAGE

## Kinko's—Grace under Pressure

As pressures from globalization, disruptive technologies, and environmental concerns stretch some companies to their limits of flexibility, Kinko's continues to adapt. Purchased by FedEx in February of 2003, Kinko's expects to continue under its current mission and core values. Kinko's, by any definition, is a huge consumer of resources. The power to keep a store running is equivalent to that used by 23 homes. The firm estimates that it uses 32 million sheets of paper per day, 60,000 tons per year (that's 10.5 square miles of forest).

Kinko's has nine core value statements, ranging from acceptance of responsibility for its actions to customer service excellence and teamwork, but one in particular stands out as evidence of its concern for the environment:

**Community and environment:** We strive to help and improve the communities where we work and live. We are concerned about the environment and promote the use of recyclable products and renewable energy.

Kinko's has restricted stores so that only its busiest remain open 24 hours per day. Even though costs are higher, in 2003 it purchased 10 percent of its energy from geothermal, solar, and wind sources.

Source: <http://www.kinkos.com>, March 26, 2004; "Can This Copy Shop Go Green," *Fast Company*, March 2004, p. 33.



The FedEx Envelope is made of 100-percent recycled material. FedEx Paks are made of 25 percent recycled Tyvek and can be returned to the manufacturer for recycling.

environmental impact as part of their decision-making processes. They have begun to accept the fact that sustainable use patterns must be developed for many of our resources, including process inputs as far-ranging as timber, fossil fuels, and fish.

Minimizing environmental impact has numerous implications for a business. Sometimes it increases processing costs in the short term. Sometimes it means that what appears to be a prime location from one perspective really isn't acceptable. Sometimes it opens new markets for "greener" products and actually gives the firm a competitive advantage over firms that haven't addressed these issues.

## Regional Pressures

In addition to global forces, regional pressures also influence business decisions. Included among these pressures are population growth and land development in rural areas. In some parts of the country there are concerns about maintaining the levels of undisturbed forests or wildlife habitat. In other parts of the country, such as the Midwest, there are concerns about the loss of farmland and the family farm. In the West, there are concerns about water use and water rights. In large cities there are health worries related to the number of smog days. Clearly, businesses have begun to recognize their role in a larger natural system and are learning how to minimize the negative impact on that system. The importance of these issues for future decisions can only be expected to increase.

## Business Outputs: Products and Services

In today's economy, it is impossible to completely separate service-producing industries (traditionally known as "services") from product-producing businesses (traditionally known as "manufacturers"). Successful firms have recognized that potential customers do not compartmentalize value that way. Customers look at the total package, which includes aspects of both services and products. Failure to recognize this greatly reduces a firm's ability to compete. Studies by the American Society for Quality (ASQ) confirm this perspective. Since 1994, despite significant improvement in product quality, overall customer satisfaction has continued to drop, leaving no doubt that the service aspects of doing business are not meeting expectations. From a competitive standpoint, it means that providing a high-quality product is necessary, but not sufficient, to effectively compete.<sup>4</sup>

Despite the integrated nature of business outputs and the difficulty in defining a business as a service or a manufacturer, it is important to understand that business outputs *can* be defined distinctly as either a service or a product. Even though these components are perceived by the customer as one entity, they are often produced separately.

## Products

Products are *things*. They're tangible. They can be seen, they can be touched, they can be counted, they can be measured, and they can be stored for later use. They are produced by manufacturers. The fact that products are tangible has many management implications, most of them advantageous to managers.

Because a product is tangible, its quality can be measured in a relatively straightforward manner before a customer has a chance to examine it. The function of the product can be measured and actually tested to make sure it works properly, allowing management to avoid exposing customers to poor quality. Electronic products are tested upon completion. Automobiles are examined for defects. Clothing is inspected for flaws in the fabric. The defective product is separated from the good products and is either fixed or destroyed.

A completed product can be stored in finished-goods inventory until needed, or it can be shipped anywhere in the world for use. Some products are stored for only a short time before being consumed (some food, pharmaceuticals, stylish clothing, and newspapers, for example), but others have an extremely long shelf life (furniture, books, and toys, for example). When products can be stored for later use, their actual rate of production does not have to match the rate of demand in the short term. Matching output rate to a fluctuating demand is difficult, particularly when materials have to be ordered in advance and employees have to be hired and trained in advance. The ability to store products is important to production management.

When a product is purchased, the customer typically has no idea of the conditions associated with its production. She doesn't care if processes are noisy, if they smell bad, or if the machines are dirty. It's the outcome of those processes that matters. The finished product is evaluated in terms of quality, but the process used to create it isn't. As consumers become more aware of production, however, they have also become more concerned. Consumers were shocked, for example, when they found out that certain clothing items they wore were being manufactured by children and in unacceptable conditions. In some cases, the companies that purchased the goods weren't even aware of the conditions in which they were manufactured. Issues such as employee exploitation and impact on environment have begun to interest consumers. Attributes such as the friendliness of the employees or the ambiance of the factory, however, make no difference.

## Services

Services are intangible. They can't be touched or counted or examined the way a product can. They can't be stored for later use. Services are tasks that are done for the customer or done to the customer. They can't be examined or tested for quality before the customer gets them. In fact, they are often produced in a process that the customer is actually a part of. Sometimes it is the customer that is actually processed. The intangibility and customer involvement create a situation that can be quite difficult to manage. In a service, the customer *does* care about the production process because he spends time in it. The process can be as important as the outcome. The process utilized to entertain a customer at a theme park matters a great deal. The process a retailer uses to sell products defines the quality of service a customer perceives. The process a financial consultant uses to plan investments for a client matters because she is a player in that process.

A close match between the output rate and the demand rate is critical for services because people aren't willing to wait for a process to catch up with them. Access to an online retailer, for example, must be immediate or the customer will click on an alternative. A seat on an airplane must be available when a customer wants it or he'll simply buy a

ticket on a competing airline. If either business has idle server capacity or empty seats at a particular time, it can't store that capacity for later use.

Unfortunately for managers of services, service quality cannot be determined until after the fact. For customers, this means that they're exposed to poor quality service more often than they're exposed to poor quality products. Unlike manufacturing managers, who can "scrap" or "rework" defective products, service managers must attempt a "recovery" when customers are exposed to quality failures. When a restaurant finds out that a customer is dissatisfied, management attempts the recovery by providing complimentary drinks or a gift certificate for free meals at a later date.

Customers place higher expectations on the employees in services because they are often face to face with them. When the customer watches a service production process and is involved in it, expectations for "special treatment" are common. A rule of thumb is that the greater the customer contact, the greater the expectation for customization, and the more difficult it is to maintain efficient processes. Banking by ATM, phone, and online removes customers from direct contact with bank personnel. For students, online registration has improved the efficiency of that process by removing direct student contact. The need to meet varied expectations and customize the service can make the management of a service more difficult and customer expectations harder to meet. Many services have removed service processes from customer access to increase productivity. Exhibit 1.4 summarizes the characteristics of products and services.

As can be seen in Exhibit 1.5, business outputs often blend product and service components. For example, you might order a product directly from a manufacturer, but along with that product comes a lot of services. Dell Computer Corporation provides an excellent example of a manufacturer that has blended products and services. A customer buys a computer directly from Dell and receives services as well. One is fast delivery. The second is on-site support. The customer can also buy additional services, such as extended support. Dell's success, particularly in quantity purchases for businesses and schools, is not dependent solely on the quality of its products but can also be traced directly to its reputation for after-the-sale support.

For many traditional product-oriented companies, managers are finding that good service not only helps sell products but can also be profitable. Auto companies dramatically increased incentives to buyers in 2001 in response to declining sales during the economic downturn, resulting in record sales. They expected a sharp decline in 2002 and hoped to balance that decline by improved used car sales, which actually have higher margins than new cars. The economic slowdown resulted in customers keeping cars longer. Those older cars needed more service. At large dealer chains, repairs and service part sales made up 10 to 12 percent of revenues but created up to 35 percent of the net profits.<sup>5</sup>

**EXHIBIT 1.4****Summary of Product and Service Output Differences**

<b>Products</b>	<b>Services</b>
Products are tangible.	Services are intangible.
Products are easy to measure.	Services are difficult to measure.
Products can be stored for later use.	Services can't be stored for later use.
Products can be checked for conformance to quality prior to customer receiving them.	Services can't be checked for conformance to quality prior to customer receiving them.
Production processes for products are relatively unimportant to customers.	Production processes for services are very important to customers.
Producers of defective products can repair or scrap the defects.	Producers of defective services must attempt to recover to retain the customer.

Continuum of Service and Product Producers			EXHIBIT 1.5
Produces Services Only	Produces a Balance of Products and Services	Produces Products with Very Few or No Services	
<i>Examples:</i>	<i>Examples:</i>	<i>Examples:</i>	
Advertising firm	Retailer	Furniture manufacturer	
Brokerage firm	Computer manufacturer	Paint manufacturer	
Bank	Automobile manufacturer	Grocery product manufacturer	
Prison	Restaurant	Steel mill	
Tanning salon	Car rental agency		
Hair stylist	Landscaping firm		
	Printing shop		

Service management tends to follow manufacturing management in adopting new management approaches. Productivity and quality improvement efforts initiated in manufacturing often move to the service sector. In the past decade it has become increasingly common for manufacturers to outsource labor-intensive aspects of production to countries with cheaper labor. That has been made possible by the ease of transporting products, compared to the difficulty in transporting services. Services have begun to follow suit. Labor markets in the United States have increased the incentive for U.S. services to seek labor from outside the country.

An excellent example of this trend is the **maquiladoras**. Maquiladoras have traditionally been known as foreign-owned manufacturing (usually assembly) plants in Mexico. A company establishes a plant in Mexico, usually just across the border from the United States. Since the plant is company-owned, the company could import the components into Mexico duty-free and then export finished products back to the United States. Maquiladoras have been very popular as a means of lowering labor expenses in a variety of manufacturing industries, including automotive, electronics, and garment manufacturing. They have also been controversial in that some companies' primary motivation to manufacture in Mexico has been to avoid Environmental Protection Agency (EPA)

**maquiladoras**  
Foreign-owned (typically U.S.-owned) manufacturing plants in Mexico.



For many businesses, classification as a “service” or a “manufacturer” is difficult. For KFC, which is typically classified as a service, the product is also very important to the customer. A customer could just as easily be dissatisfied about the meal as the service offered along with it.



requirements. The use of maquiladoras extended into the service sector and by early 2000, approximately 50,000 Mexican workers were employed by service maquiladoras. Outsourcing of services has since moved to India and the Philippines, and even to China. Providing back-office support services such as call center management and other services for retailers, financial services, telecom, and software companies is commonplace.<sup>6</sup>

## Different Types of Customers

The impact customers have on a business is enormous. After all, they determine the value of what the business produces. Unfortunately, what's valuable to one is worthless to another. For a successful business, knowing which is which is critical. One important way to categorize customers is by their use of the product or service being sold.

Businesses buy material goods for their own consumption, and also as components used in the products or services they sell. The materials they consume, such as cleaning compounds, lubricants, or machine repair parts, are known as maintenance, repair, and operating (MRO) inventory. Component parts, such as memory chips for a computer manufacturer, also become part of the company's inventory. A business also purchases services. It might contract with a firm to provide security, hire a consulting firm to design an information system, or hire a transportation company to deliver its products. Business-to-business transactions have become such a major part of the economy that they have taken on an acronym—B2B. Business-to-consumer transactions have been tagged B2C.

Consumers buy products and services that they utilize in their day-to-day activities. Businesses have very different uses for what they buy than a consumer would have. Consequently, they define the value of products and services differently than consumers would. In some cases, a firm might produce a product or service for a business as well as for a consumer. Despite the fact that the product or service might be the same for each type of customer, the business customer and the consumer would still define value differently. Exhibit 1.6 shows a comparison of companies that produce different types of outputs and serve different types of customer.

EXHIBIT 1.6

Business Output/Customer Matrix

		Business Output		
		Predominantly Services	Products and Services	Predominantly Products
Customer Type	<b>Consumers (B2C)</b>	<i>Examples:</i> Mayo Clinic Disney World Time Warner Cable	<i>Examples:</i> General Motors Dominos Pizza Amazon	<i>Examples:</i> Coca-Cola Panasonic Mattel Kraft Longaberger
	<b>Consumers and Businesses (B2C and B2B)</b>	<i>Examples:</i> Staples UPS Verizon Wireless CitiBank Ebay	<i>Examples:</i> Dell Computers Hewlett-Packard General Electric	<i>Examples:</i> Herman-Miller SanDisk Linksys
	<b>Businesses (B2B)</b>	<i>Examples:</i> TQL Logistics iX Web Hosting Accenture Covisint	<i>Examples:</i> Ariba PeopleSoft Cintas Flextronics	<i>Examples:</i> Delphi Xerox Opticon

## Operations, Other Business Functions, and You

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A business environment characterized by speed and flexibility cannot afford to be constrained by the boundaries imposed by traditional departmental barriers. Business decisions must be made quickly and made from an enterprise perspective, considering implications for all aspects of the business. For this very reason, companies increasingly use cross-functional teams on tasks such as new product and service development, systems implementation, and process improvement. These companies have become more organized around their products and services, and less organized around the functional areas within their organizations. For many firms, responsibilities are dispersed among a variety of staff. It is not at all uncommon for someone with financial expertise to be involved in what have traditionally been marketing issues or for someone with marketing expertise to be involved in quality management.

As businesses continue to break down functional barriers, functional experts will continue to take on broadened responsibilities that relate to business processes, rather than department functions. For business functions like operations, marketing, finance, accounting, and information systems, departmental affiliations will continue to become less meaningful than the needs of the organization. The functional responsibilities and tasks must still be accomplished, because they are part of an important business process. That process, however, will be the focal point instead of the department. As these trends continue we will see all business functions take on new shapes and new roles in the business.

Value derives from processes. A process is an accretion of resources. The resources necessary to create a value-adding process often come from different parts of the business. Amazon.com provides an excellent example of how differentiating capabilities emerge from bringing together very different resources. Amazon's ability to provide a book (or other product) at a very low price and do it very quickly sets it apart from competitors. There is no need to go elsewhere, because if the book exists, Amazon can get it. An examination of all the processes required to take the order, process the credit card information, and deliver the book to the customer shows that resources from many different parts of the company have to come into play: marketing and information technology experts develop the customer interface; financial, accounting, and computer experts develop the mechanisms necessary to handle the credit card transactions online; purchasing and contract experts develop relationships with suppliers; logistics and operations experts design and maintain the outgoing flow of products. Amazon could be broken into a series of small processes, but they must all interact with each other. Without any single piece, the differentiating capability doesn't exist.

The interaction among processes makes it particularly important for all managers to have a basic knowledge of all business functions. As transaction speeds increase, and as companies interact more directly with customers, the need to see across boundaries and recognize potentially valuable resources will increase. An employee who can recognize resources in other areas of the business that can be combined with resources of his own to form new processes has mastered one of the most difficult and valuable aspects of new product and service development. Without the knowledge of how all functions interact in the business, ideas will be limited to very narrow applications of resources. There is little remaining "low-hanging fruit" in the area of new products and services. The lack of an enterprise perspective limits the firm's potential for success, and it limits the career potential of its employees as well. A business student's differentiating capability, which separates her from her classmates in the eyes of a recruiter, will not be her major. Even when she compares her preparation to that of any other business major, the difference is only 10 to 15 percent of the courses taken. The differentiating capability is something special: Any ability a student has that enables her to perceive the business from a broader perspective will set her apart.

## CHAPTER SUMMARY

This chapter introduced operations management as a critical component of the successful management of a business. Operations management is the management of productive resources that are used to create salable products or services. It is that sale of products and services that provides an opportunity for profitability.

The Resource/Profit Model was introduced as an organizing framework of operations concepts. The model provides three primary elements. The first, foundations for success, consists of value, strategy and value, and processes. The second, components of value, consists of cost, quality, and timeliness. The third, managing resources used to create value, consists of demand forecasting, followed by inventory, logistics, capacity, facilities, and workforce. These resource management topics are enhanced by three integrative frameworks: supply chain management, lean systems, and constraint management.

An overview of the Resource/Profit Model shows that profitability results from the creation of value and a strategy for maintaining a link to the customers who define it. The creation of value at a level that exceeds the cost of creating it provides the potential for profitability. Operations management has responded to and will continue to respond to four dominant environmental forces: competition resulting from the globalization of business, increasing levels of communication and competition brought about by the Internet and other disruptive technologies, the impact of the natural environment, and regional pressures that have varying impacts on business decisions.

Two business outputs—products and services—are critical to the management of operations resources. Effective operations management must acknowledge the differences and similarities of those environments. Two different types of customer—B2B and B2C—must be recognized because of the differences in their expectations and needs.

Last, but certainly not last in importance, the importance of operations familiarity—and familiarity with all aspects of the enterprise—is discussed as an important way for the business student to differentiate himself or herself from other students. It is an employee's ability to make the best decisions for the business, after all, that is most highly prized.

## KEY TERMS

capabilities, 14	logistics, 18
capacity, 19	maquiladoras, 25
constraint management, 17	mass production, 8
cost, 15	processes, 14
craft production, 8	profitability, 13
disruptive technology, 21	quality, 15
facilities, 19	strategy, 14
integrative management framework, 17	timeliness, 15
inventory, 18	value, 13
lean systems, 17	workforce, 19

## REVIEW QUESTIONS

1. Why is it important for students with any business major to have a basic understanding of all aspects of a business?
2. What does operations management mean?
3. Describe the Resource/Profit Model. What are the foundations for success? What are the components of value? What resources are managed to create value?

4. What is the relationship between value created and profitability?
5. How does cost affect the amount of profitability that results from value?
6. Why do resources alone not create value for a business?
7. Who ultimately defines the value of a product or service?
8. What are “differentiating capabilities”?
9. Provide an example of how inventory, capacity, facilities, and workforce can each contribute to value.
10. What are integrative management frameworks? What do they provide for managers?
11. How do products and services differ?
12. What is the management impact of the intangibility of services?
13. Why are most manufacturers also typically service providers?
14. What do B2B and B2C mean? Why is the difference important?

### DISCUSSION AND EXPLORATION

1. How has the speed of transactions made possible by the Internet had a positive impact on your life? What are some of the ways the impact has been negative?
2. Identify a product or service that you frequently purchase. Identify all of its value components. Which are the most important? Which are you are most frequently dissatisfied with?
3. Examine a process on your campus that you are familiar with. What steps in it do not add value? What are the costs, for the customer, associated with these steps? What are the costs for the university? In what ways would the process be improved if the non-value-adding steps were removed?
4. Identify and describe a business you are familiar with that has had to adapt to increasing levels of competition. Where has the competition come from? How has the business changed in response? Have its changes been successful?
5. Identify and describe a business you are familiar with that has had to adapt to increasing competition from an Internet-based business. How has it changed? Has it been successful?
6. How do most students prioritize cost, quality, and timeliness for services? For products?
7. Consider a recent significant purchase you made. Beyond the price, what other costs were associated with that purchase? Did they affect your purchase decision?
8. What changes have you observed in products and services that indicate pressures on business to have less impact on the natural environment? Have these changes had an impact on your purchase decisions?
9. Describe a business whose major focus is difficult to classify as either a product or a service. What makes it difficult to categorize? Which parts of the business would be the most difficult to manage—producing the services or producing the products? Why?
10. Identify a product or service that would likely be purchased by both consumers and businesses. How might the B2B and the B2C customers differ in terms of how each defines value? What components of value would be the most important for each?
11. Exhibit 1.6 provides examples of businesses that fit into the business output/ customer matrix. Identify two businesses with which you are not familiar that provide products and/or services to businesses. Explain what each does.

## ENDNOTES

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5. "Can Car Dealers Keep the Profits Rolling?" *BusinessWeek*, January 14, 2002, p. 37.
6. "Outsourcing: Make Way for China," *BusinessWeek*, August 4, 2003.

## LEARNING ACTIVITIES

[www.mhhe.com/opsnow3e](http://www.mhhe.com/opsnow3e)

Visit the Online Learning Center ([www.mhhe.com/opsnow3e](http://www.mhhe.com/opsnow3e)) for additional resources. Content varies by chapter, and includes

- |                  |                                |
|------------------|--------------------------------|
| ■ Business Tours | ■ Interactive Case Models      |
| ■ OM on Site     | ■ Additional Advanced Problems |
| ■ Readings       | ■ Self-Assessment Quizzes      |
| ■ Resources      | ■ Glossary                     |
| ■ Excel Tutors   |                                |

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## VIDEO CASE 1.1

## Operations Management at St. Alexius Medical Center

### Based on Video 1 on the Student DVD

St. Alexius Medical Center has eight Centers of Excellence, one of which is their Pediatrics Center. Like all businesses, the St. Alexius Pediatrics Center must bring inventory, capacity, facilities, and workforce resources together to create value in ways that patients feel is superior to alternative pediatrics treatment centers. St. Alexius has designed a new Pediatrics Center facility to meet this challenge.

1. In their study of other hospitals that was done prior to the Operations Plan, what did they find out about customer expectations? How does this link to St. Alexius's creation of value?
2. In the new design, what are the considerations being made to better manage inventory and suppliers, capacity, the facilities, and the workforce?
3. Are the value components of cost, quality, and timeliness important for the St. Alexius Pediatrics Center? How would patients (and their parents) define the components of value? How will the new facility enhance these components?
4. Like other businesses, changes are often driven by technological advances. What technologies are driving changes at St. Alexius?
5. Examine the St. Alexius Medical Center Web site at [www.stalexius.org](http://www.stalexius.org). Read the "About St. Alexius" information and describe how, in general, St. Alexius characterizes itself.

