Order qualifiers are the characteristics of a product or service that qualify it to be considered for purchase by a customer. An **order winner** is the characteristic of a product or service that wins orders in the marketplace—the final factor in the purchasing decision. For example, when purchasing a 4K TV, customers may determine a price range (order qualifier) and then choose the product with the most features (order winner) within that price range. Or they may have a set of features in mind (order qualifiers) and then select the least expensive player (order winner) that has all the required features.

Order qualifiers The characteristics of a product or service that qualify it to be considered for purchase.

Order winner The characteristic of a product or service that wins orders in the marketplace.

Order winners and order qualifiers can evolve over time, just as competencies can be gained and lost. Japanese and Korean automakers initially competed on price but had to ensure certain levels of quality before the U.S. consumer would consider their product. Over time, the consumer was willing to pay a higher price for the assurance of a superior-quality Japanese car. Price became a qualifier, but quality won the orders. Today, high quality, as a standard of the automotive industry, has become an order qualifier, and innovative design or superior gas mileage wins the orders.

As shown in **Figure 1.13**, order qualifiers will only take a firm so far. The customer expects the qualifiers, but is not "wowed" by them. For example, a low price might be a qualifier, but reducing the price further may not win orders if the features or design are not adequate. At a minimum, a firm should meet the qualifiers. To excel, the firm needs to develop competencies that are in tune with the order winners. Marketing helps to identify these qualifiers and winners. Oftentimes, these characteristics are in the purview of operations and supply chain management, such as cost, speed to the market, speed of delivery, or customization. Other characteristics such as product or service design are supported by operations and supply chain management, but are not completely under their control.

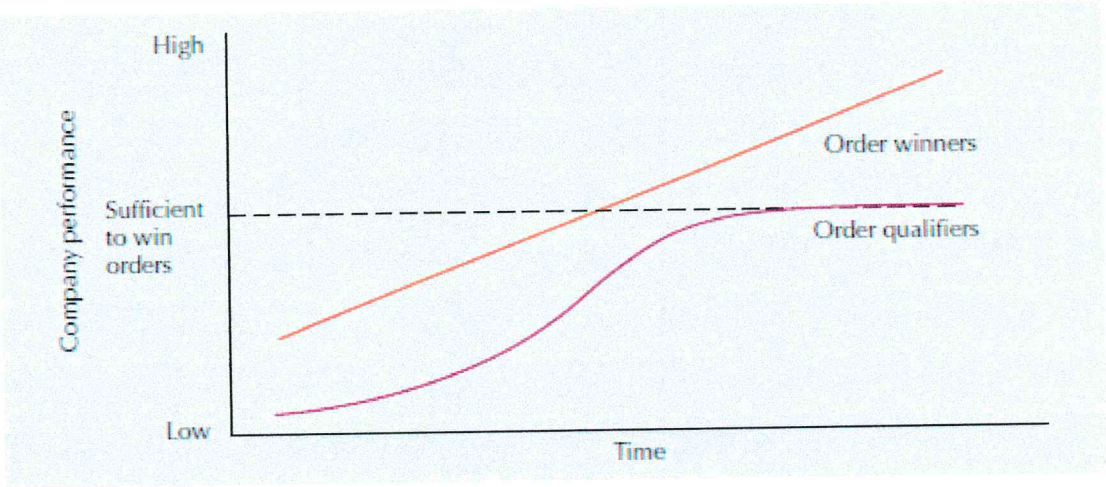

FIGURE 1.13 Order Winners and Order Qualifiers

Source: Adapted from *Operations and Process Management*, Nigel Slack, Stuart Chambers, Robert Johnston, and Alan Betts, *©2006 Prentice Hall. Reproduced with permission of Pearson Education, Inc.*

Positioning the Firm

No firm can be all things to all people. Strategic **positioning** involves making choices —choosing one or two important things on which to concentrate and doing them extremely well. A firm's positioning strategy defines how it will compete in the marketplace—what unique value it will deliver to the customer. An effective positioning strategy considers the strengths and weaknesses of the organization, the needs of the marketplace, and the positions of competitors.[2]

Positioning How the firm chooses to compete.

Let's look at firms that have positioned themselves to compete on cost, speed, quality, and flexibility.

Competing on Cost Companies that compete on cost relentlessly pursue the elimination of all waste. In the past, companies in this category produced standardized products for large markets. They improved yield by stabilizing the production process, tightening productivity standards, and investing in automation. Today, the entire cost structure is examined for reduction potential, not just direct labor costs. High-volume production and automation

may or may not provide the most cost-effective alternative. A lean production system provides low costs through disciplined operations.

Competing on Speed More than ever before, speed has become a source of competitive advantage. The Internet has conditioned customers to expect immediate response and rapid product shipment. Service organizations such as McDonald's, LensCrafters, and FedEx have always competed on speed. Now manufacturers are discovering the advantages of *time-based competition*, with build-to-order production and efficient supply chains. In the fashion industry where trends are temporary, Gap's six-month time-to-market can no longer compete with the nine-day design-to-rack lead time of Spanish retailer Zara.

Competing on Quality Most companies approach quality in a defensive or reactive mode; quality is confined to minimizing defect rates or conforming to design specifications. To compete on quality, companies must view it as an opportunity to please the customer, not just a way to avoid problems or reduce rework costs.

To please the customer, one must first understand customer attitudes toward and expectations of quality. One good source is the American Customer Satisfaction Index compiled each year by the American Society for Quality and the National Quality Research Center. Examining recent winners of the Malcolm Baldrige National Quality Award and the criteria on which the award are based also provides insight into companies that compete on quality.

The Ritz-Carlton Hotel Company is a Baldrige Award winner and a recognized symbol of quality. The entire service system is designed to understand the individual expectations of more than 500,000 customers and to "move heaven and earth" to satisfy them. Every employee is empowered to take immediate action to satisfy a guest's wish or resolve a problem. Processes are uniform and well defined. Teams of workers at all levels set objectives and devise quality action plans. Each hotel has a quality leader who serves as a resource and advocate for the development and implementation of those plans.

Competing on Flexibility Marketing always wants more variety to offer its customers. Manufacturing resists this trend because variety upsets the stability (and efficiency) of a production system and increases costs. The ability of manufacturing to respond to variation has opened up a new level of competition. **Flexibility** has become a competitive weapon. It includes the ability to produce a wide variety of products, to introduce new products and modify existing ones quickly, and to respond to customer needs.

Flexibility In operations, the ability to adjust to changes in product mix, production volume, or product and process design.

Shoes, bicycles, and suits are examples of standard products that can be built or "tailored" to individual customers. Republic Bikes, Villy Customs (a Shark Tank winner), and Mission Bikes are but a few of the customized biking shops that fit bicycles to exact customer measurements and encourage customized colors, handlebars, frames, and other design options. Bicycle manufacturers typically offer customers a choice among 20 or 30 different models. Handcrafted customer designed bicycles can be configured in thousands of different ways. Computer-aided design (CAD) and computer-aided manufacturing (CAM) allow customized products to be essentially mass produced. The popular term for this phenomenon is **mass customization**.

Mass customization The mass production of customized products.

Competing on Innovation Companies that compete on innovation establish a corporate culture that encourages risk taking, challenges the status quo, accepts failure as part of the learning process, and celebrates successes. Three such companies are Apple, Google, and 3M. Apple *thinks different* to create incredibly fresh, beautiful game-changing designs. Google's open culture has produced such innovations as Google Street View, Google Fiber, Google People Finder (for disasters), Google Driverless Vehicles, and Google Glass. 3M defines itself as a global innovation company that never stops inventing. Ranging from Post-It notes to micro-needle skin patches designed to replace hypodermic needles, 3M produces hundreds of small innovations each year that improve how products or services operate. Like Google, 3M sets aside 20% of its engineers' time to be spent on projects of their own choosing. 3M also gives out $100,000 genius grants to its employees and has its own venture capitalist program that supports disruptive, early-stage innovations outside of the company's existing portfolio.

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Innovation is exciting; however, it is not a competitive advantage if it cannot be transformed into marketable and profitable products or services (read about Xaiomi and its competitor OPPO in the "Along the Supply Chain" box). That's where operations and supply chain management come into play. We'll discuss their role more directly in Chapter 4 on Product Design.

Strategy Deployment

Implementing strategy can be more difficult than formulating strategy. Strategies unveiled with much fanfare may never be followed because they are hard to understand, too general, or unrealistic. Strategies that aim for results five years or so down the road mean very little to the worker who is evaluated on his or her daily performance. Different departments or functional areas in a firm may interpret the same strategy in different ways. If their efforts are not coordinated, the results can be disastrous.

Consider Schlitz Brewing Company, whose strategy called for reduced costs and increased efficiency. Operations achieved its goals by dramatically shortening its brewing cycle—and, in the process, lost 6 of every 10 customers when the clarity and taste of the beer suffered. The efficiency move that was to make the company the most profitable in its industry instead caused its stock value to plummet from $69 per share to $5 per share. Schiltz has since been sold to Pabst Brewing Company, who combed through company documents and interviewed retired Schlitz brewmasters and taste-testers to derive and reintroduce the original 1960s "with gusto" formula.

Strategy deployment converts a firm's positioning strategy and resultant order winners and order qualifiers into specific performance requirements. Companies struggling to align day-to-day decisions with corporate strategy have found success with two types of planning systems—policy deployment and the balanced scorecard.

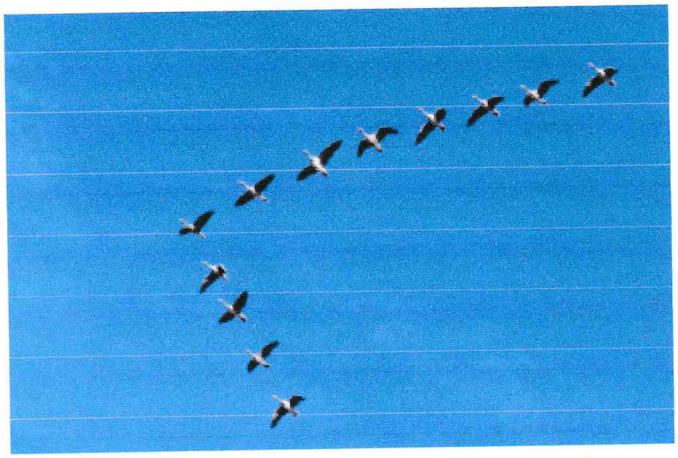
Policy Deployment Policy deployment, also known as hoshin planning, is adapted from Japan's system of *hoshin kanri*, which is roughly translated from Japanese as "shining metal pointing direction"—a compass.

Policy deployment tries to focus everyone in an organization on common goals and priorities by translating corporate strategy into measurable objectives throughout the various functions and levels of the organization. As a result, everyone in the organization should understand the strategic plan, be able to derive several goals from the plan, and determine how each goal ties into their own daily activities.

Policy deployment A planning system for converting strategy to measurable objectives throughout all levels of an organization.

Suppose the corporate strategic plan of competing on speed called for a reduction of 50% in the length of the supply chain cycle. Senior management from each functional area would assess how their activities contribute to the cycle, confer on the feasibility of reducing the cycle by 50%, and agree on each person's particular role in achieving the reduction. Marketing might decide that creating strategic alliances with its distributors would shorten the average time to release a new product. Operations might try to reduce its purchasing and production cycles by reducing its supplier base, certifying suppliers, using e-procurement, and implementing a just-in-time (JIT) system. Finance might decide to eliminate unnecessary approval loops for expenditures, begin prequalifying sales prospects, and explore the use of electronic funds transfer (EFT) in conjunction with operations' lean strategy.

Internet Exercises



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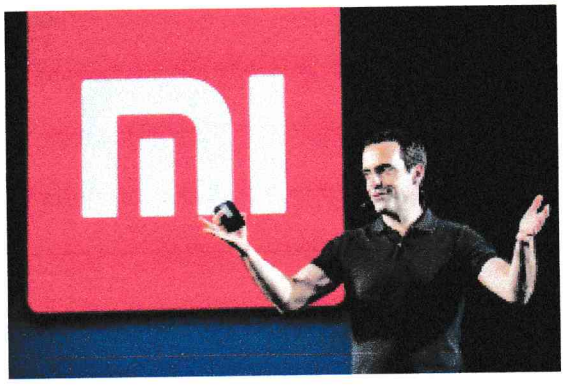
Is your company pointed in one direction? AT&T uses the analogy of migrating geese to explain the concept of policy deployment. Naturalists believe the instinctive V-formation allows the geese to follow one leader and migrate in a cohesive unit toward their destination. Policy deployment does the same thing—it enables business leaders to mobilize the organization toward a common destination, aligning all employees behind a common goal and a collective wisdom.

Along the Supply Chain

New Players Disrupt with Innovation

New companies entering an established market often disrupt how products are perceived, made, or delivered. Apple and Samsung are still the world's leading smartphone manufacturers, but as the market for smartphones matures, look out for high performers in emerging markets, such as Huawei, OPPO, and Xiaomi (see photo). Business is, after all, played out on a global landscape. So what do these newcomers bring to the table?



Bloomberg/Contributor/Getty Images, Inc.

For one thing, Xiaomi, an Android-based product, updates its operating system once a week, and each week the batch of phones shipped by Xiaomi are "incrementally better" than the last batch. Yes, every Friday, Xiaomi delivers unmatched responsiveness to an expanding base of loyal customers who provide input in online forums and company-sponsored community engagements. Online sales account for 70% of Xiaomi's orders. These pre-orders allow the company to purchase materials only after orders are placed and basically build each phone to order. The reduced risk of forecast errors and surplus material saves costs and lets the company look for other ways to add value. For example, the phone's platform is now available in more than 20 languages. Retail prices have been kept very close to manufacturing costs.

OPPO has a different strategy, focusing on Southeast Asia, South Asia, Africa, and the Middle East. In India alone, OPPO has 35,000 sales outlets and close to 200 service centers. Branding its products the "OPPO Camera Phone" and "Selfie Expert," the company knows that a superior camera is the most important feature for India's market and that experiencing the phone is the key to building market share. OPPO designs, develops, manufactures, markets, and sells its products with full control over the entire supply chain. It's also the number-three producer of wearables, behind Fitbit and Apple.

Notice in each case, finding a gap, choosing a strategy and supporting it through a corresponding operations and supply chain strategy can lead to results.

Source: John Hagel, John Brown, Duleesha Kulasooriyam, Craig Giffi, and Menmend Chen, "The Future of Manufacturing: Making things happen in a changing world," Deloitte University Press, 2015, p. 32; "OPPO Launches F1 'Selfie Expert' in India," *Indian News and Times*, January 29, 2016; Company website, www.oppo.com (accessed February 8, 2016).

The process for forming objectives would continue in a similar manner down the organization with the *means* of achieving objectives for one level of management becoming the *target*, or objectives, for the next level. The outcome of the process is a cascade of action plans (or **hoshins**) aligned to complete each functional objective, which will, in turn, combine to achieve the strategic plan.

Hoshins The action plans generated from a policy deployment process.

Figure 1.14 shows an abbreviated operations action plan for reducing supply chain cycle time. Policy deployment has become more popular as organizations become more geographically dispersed and culturally diverse.

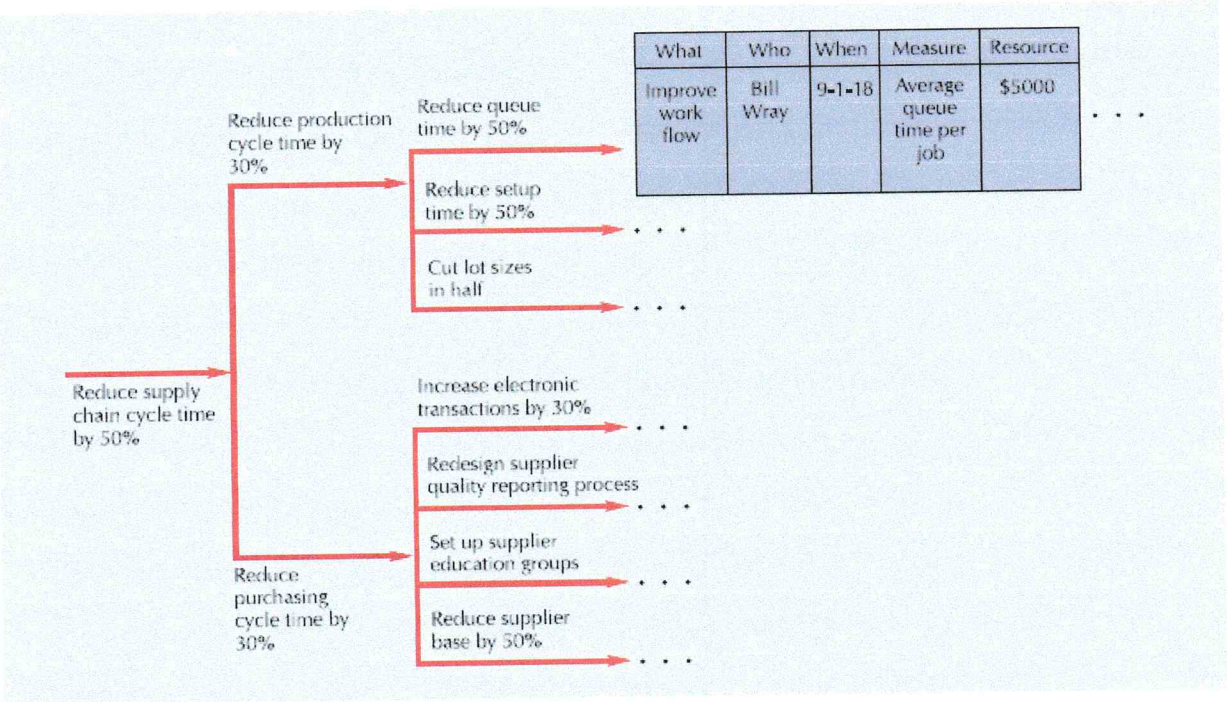


FIGURE 1.14 Derivation of an Action Plan Using Policy Deployment

Balanced Scorecard The **balanced scorecard**, developed by Robert Kaplan and David Norton,[3] examines a firm's performance in four critical areas:

1. *Finances*—How should we look to our shareholders?
2. *Customers*—How should we look to our customers?
3. *Processes*—At which business processes must we excel?
4. *Learning and Growing*—How will we sustain our ability to change and improve?

Balanced scorecard A performance assessment that includes metrics related to customers, processes, and learning and growing, as well as financials.

It's called a *balanced* scorecard because more than financial measures are used to assess performance. Operational excellence is important in all four areas. How efficiently a firm's assets are managed, products produced, and services provided affect the financial health of the firm. Identifying and understanding targeted customers helps determine the processes and

capabilities the organization must concentrate on to deliver value to the customer. The firm's ability to improve those processes and develop competencies in new areas is critical to sustaining competitive advantage.

Table 1.3 is a balanced scorecard worksheet. The worksheet selects areas of the strategy map to incorporate in annual objectives for the company. The objectives are then operationalized with **key performance indicators (KPI)**. The goals for the year are given, and the KPI results are recorded. The score converts the different performance measures into percentage completed. For example, if the goal is to achieve 12 inventory turns a year and the company manages only 6, then the goal is 50% achieved. The mean performance column averages the score for each dimension. The scorecard performance can be visualized in many ways, two of which are illustrated in Figures 1.15 and 1.16.

Key performance indicators (KPI) A set of measures that help managers evaluate performance in critical areas.

TABLE 1.3 The Balanced Scorecard Worksheet

	DIMENSION	OBJECTIVES	KEY PERFORMANCE INDICATOR	GOAL FOR 2015	KPI RESULTS TO DATE	SCORE	MEAN PERFORMANCE
Finances	Productivity	Become industry cost leader	% reduction in cost per unit	20%	10%	50%	65%
	Growth	Increase market share	Market share	50%	40%	80%	
Customers	Quality	Zero defects	% good quality first pass	100%	80%	80%	87%
	Timeliness	On-time delivery	% on-time deliveries	95%	90%	95%	
Processes	Suppliers	Integrate into production	% orders delivered to assembly	50%	40%	80%	73%
		Reduce inspections	% suppliers ISO 9000 certified	90%	60%	67%	
	Products	Reduce time to produce	Cycle time	10 mins.	12 mins.	83%	52%
		Improve quality	# warranty claims	200	1000	20%	
	Distribution	Reduce transportation costs	% FTL shipments	75%	30%	40%	40%
	Service	Improve response to customer inquiries	% queries satisfied on first pass	90%	60%	67%	67%
	Risk	Reduce inventory obsolescence	Inventory turnover	12	6	50%	50%
		Reduce customer backlog	% orders backlogged	10%	20%	50%	
Learning & Growing	Human capital	Develop quality improvement skills	# of Six Sigma Black Belts	25	2	8%	35%
			% trained in SPC	80%	50%	63%	
	Information capital	Provide technology to improve processes	% customers who can track orders	100%	60%	60%	61%
			% suppliers who use EDI	80%	50%	63%	
	Organizational capital	Create innovative culture	# of employee suggestions	100	60	60%	55%
			% products new this year	20%	10%	50%	

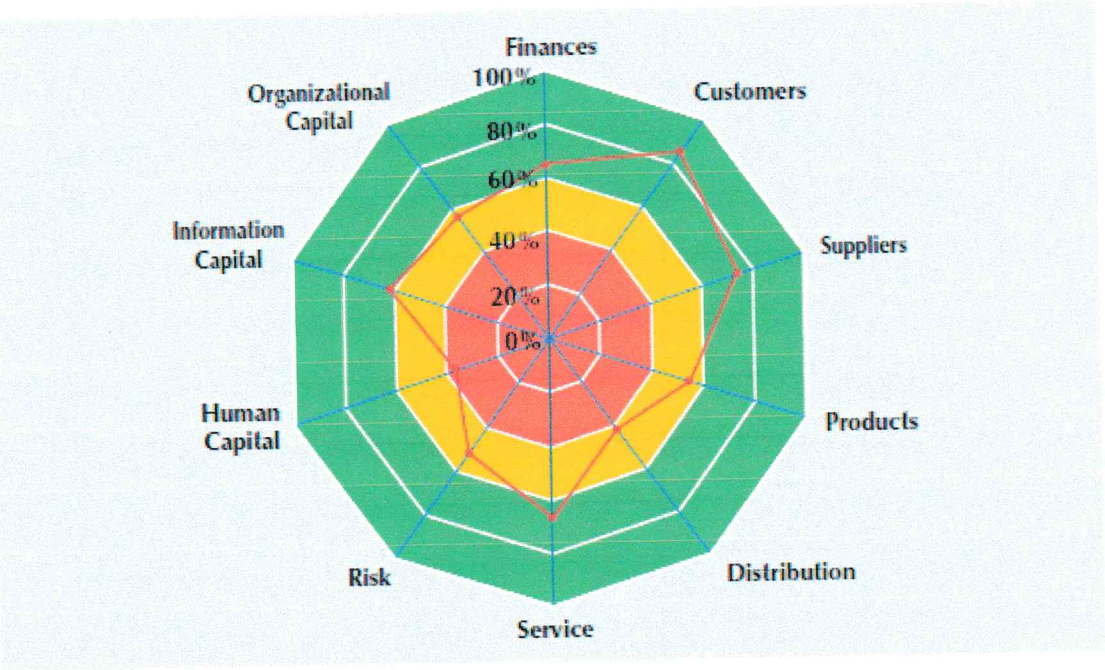


FIGURE 1.15 A Radar Chart of the Balanced Scorecard

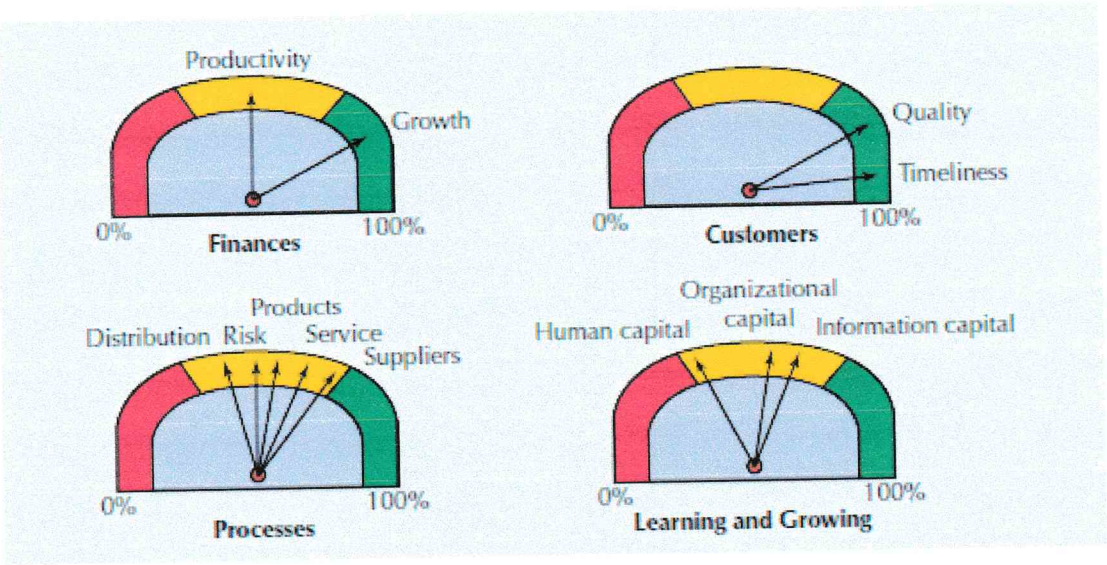


FIGURE 1.16 A Dashboard for the Balanced Scorecard

Figure 1.15 is a radar chart of the balanced scorecard. Goals 0% to 40% achieved appear in the red "danger" zone, 40% to 80% achieved are in the yellow "cautionary" zone, and 80%

to 100% achieved are in the green "moving ahead" zone. In this example, the company is in the danger zone for human capital and distribution, but is doing well with growth, quality, timeliness, and service. Figure 1.16 shows the same information in an alternative format. The dashboard presents each scorecard perspective in a different graphic. The red zone is set at 25% or less goal achievement, yellow from 25% to 75%, and green in excess of 75%, although different limits can be set for each perspective. The company excels in growth, quality, and timeliness, and is not in danger on any measure. Note that in addition to setting different limits for each gauge measures other than percentages can be used. Dashboards are popular ways for managers to quickly interpret the massive amounts of data collected each day and in some cases can be updated in real time. They often consist of graphs and other visual representations of performance.

Operations Strategy

The operations function helps strategy evolve by creating new and better ways of delivering a firm's competitive priorities to the customer. Once a firm's competitive priorities have been established, its operating system must be configured and managed to provide for those priorities. This involves a whole series of interrelated decisions on products and services, processes and technology, capacity and facilities, human resources, quality, sourcing, and operating systems. As shown in **Figure 1.17**, all these decisions should "fit" like pieces in a puzzle. A tight strategic fit means competitors must replicate the entire system to obtain its advantages. Thus, the competitive advantage from an integrated operating system is more sustainable than short-lived products or technologies. Beginning with quality, the remaining chapters in Part I put together the pieces of the operations strategy puzzle.

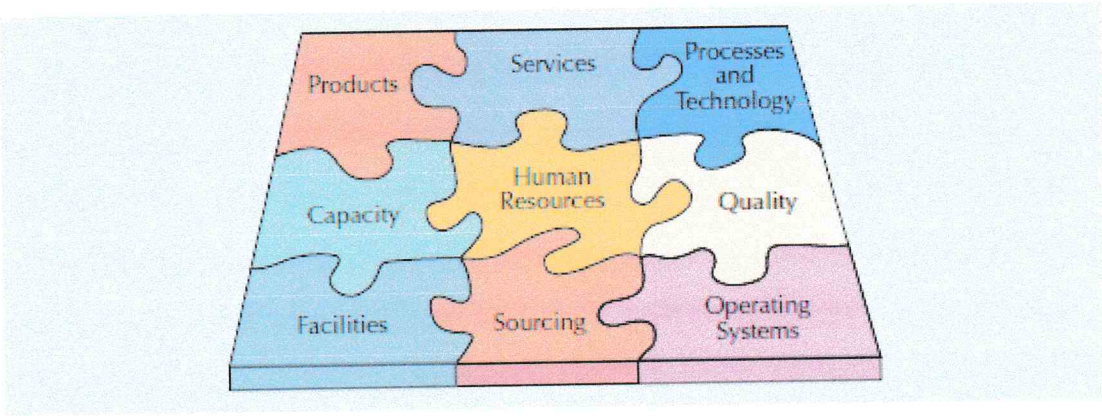


FIGURE 1.17 An Integrated Operations Strategy

Organization of This Text

The organization of this textbook reflects the emergence of supply chain management as an integral part of the study of operations. The first half of the text concentrates on issues and decisions that are common to most enterprises—ensuring quality, designing products and services, analyzing processes, designing facilities, developing human resources, and managing projects. The second half emphasizes activities that are influenced by and are most likely shared with entities along the supply chain—sourcing and logistics, forecasting demand, establishing inventory levels, coordinating sales and operations, developing resource plans, leaning operations and supply chains, and scheduling work. A diagram of the chapters in each half of the text is shown in **Table 1.4**. Please note that your professor may elect to cover these topics in a different order than presented in the text. This is perfectly understandable given the interdependency of decisions in operations and supply chain management.

TABLE 1.4 Organization of the Text

PART I—OPERATIONS MANAGEMENT	
Chapter 1	Introduction to Operations and Supply Chain Management
Chapter 2	Quality Management
Chapter 3	Statistical Process Control
Chapter 4	Product Design
Chapter 5	Service Design
Chapter 6	Processes and Technology
Chapter 7	Capacity and Facilities Design
Chapter 8	Human Resources
Chapter 9	Project Management
PART II—SUPPLY CHAIN MANAGEMENT	
Chapter 10	Supply Chain Strategy and Design
Chapter 11	Global Supply Chain Procurement and Distribution
Chapter 12	Forecasting
Chapter 13	Inventory Management
Chapter 14	Sales and Operations Planning
Chapter 15	Resource Planning
Chapter 16	Lean Systems
Chapter 17	Scheduling

Learning Objectives of This Course

The learning objectives of this course are threefold:

1. ***To gain an appreciation of the strategic importance of operations and supply chain management in a global business environment and to understand how operations relates to other business functions***. Regardless of your major, as you pursue a career in business you will need to understand the basic issues, capabilities, and limitations of operations and supply chains. By the conclusion of this course, you will be able to describe the impact of operations and supply chain management on other functions within a firm, as well as on the competitive position of the firm. You will also be more aware of the global nature of operations and the complexity of supply chains.
2. ***To develop a working knowledge of the concepts and methods related to designing and managing operations and creating value along the supply chain***. In this course, you will learn the basic steps involved in bringing a product to market from its design through production and delivery. You will also learn such skills as how to forecast demand, lay out a facility, manage a project, work with suppliers, and schedule work.
3. ***To develop a skill set for continuous improvement***. From this course, you will gain the ability to conceptualize how systems are interrelated, to organize activities effectively, to analyze processes critically, to make decisions based on data, and to push for continual process improvement. These skills will serve you well in whatever career you choose.