

# OPERATIONS STRATEGY: CONCEPT AND FRAMEWORK

*There's nothing here to take by storm; to strategy we must conform.*

Johann Wolfgang von Goethe (*Faust*, 1808).

## Learning Objectives

After reading this chapter, you will be able to:

1. Explain the concept of operations strategy and discuss its impact on an organization.
2. Adopt three complementary views to describe operations.
3. Identify the key decisions and relationships in our framework for operations strategy.
4. Use three tools to implement the principle of alignment and tailor operations strategy.

This first chapter starts by explaining the concept of operations strategy. We introduce three views to describe operations and discuss the principle of alignment or strategic fit. This naturally leads to a framework for formulating and analyzing operations strategy. The framework also identifies key decisions in operations strategy. Several tools and examples illustrate the impact of operations strategy and the technique of tailoring to increase value and alignment.

## 1.1 | WHAT IS OPERATIONS STRATEGY?

To explain the concept of operations strategy, we first review the meaning of strategy and operations. The word strategy originally referred to the military thought processes of the *stratégos*, meaning “the commander of the army” in Greek.<sup>1</sup> Nowadays, strategy simply means a specific plan of action to reach a particular objective. The essential notion of strategy is captured in the distinction

<sup>1</sup>Stratégos derives from stratos (“army”) and égoume (“to lead”). Military strategy (the planning of warfare) is only one of the three “arts” of the general. The other two are tactics (the execution of plans by deployment of forces) and logistics (the organization of supplies to support an army).

**Example 1.1 Zara and the Inditex Group**

Zara is a designer, manufacturer, distributor and retailer of fashion clothing. The first Zara shop opened its doors in 1975 in La Coruña in north-west Spain. La Coruña also witnessed the early beginnings of Zara's corporate parent, the Inditex Group, and is now home to the group's central offices. In 2005, its 724 stores could be found in the most important shopping districts of more than 400 cities in 54 countries throughout Europe, the Americas, Asia, and Africa. Zara is only one of eight business units (and brands) of the Inditex group, but is by far the largest and most profitable. It boasted net sales of 3,320 million euros in 2003, or 70% of Inditex's total. Inditex's 2001 IPO revealed its impressive financial performance: 16 percent earnings before interest and taxes, 39 percent return on capital employed, and a 24 percent revenue growth.

Zara aims to distinguish itself in the eyes of the consumer by providing timely fashion for the masses: "Zara offers the latest trends in international fashion ... In Zara, design is conceived as a process closely related to ... the concerns and demands of the public." Zara can design more than 11,000 new styles per year and put them in stores within three weeks from concept start. Source: Zara (2005), Tagliabue (2003).

between ends and means. A strategy clearly articulates what to do (the ends or the goals) and how to get it done (the means). A textbook example is Toyota's strategy which leverages its famous Toyota Production System as a powerful competitive advantage and important contributor to profitability. The Spanish company Zara, introduced in Example box 1.1, is another example: its strategy of fast fashion relies on its capability of designing more than 11,000 new styles per year with a design-to-rack time that can be as short as three weeks. Let's use these companies to illustrate the goal of strategy and how to implement that goal.

**The goal of strategy: value maximization**

Strategy is a plan to reach a particular goal. Given that we are interested in organizations or firms, we must specify the goal of the firm's strategy. Managers often say that the goal is to provide superior and sustainable performance.<sup>2</sup> It seems reasonable to measure organizational performance in terms of the *value* of the organization. Organizations thrive when they create more value for their stakeholders (owners, employees, customers, and communities) than rivals do. Ultimately, the value of an organization stems from the value it is able to create for its customers over time minus the firm's cost of providing it.

Financial metrics are indicators of organizational performance. For example, Toyota's consistent profitability generated a cumulative net income of \$36.3 billion from April 2004 to March 2007. In contrast, Ford and General Motors lost \$7.7 and \$9.7 billion, respectively, over the same three years! Example box 1.1 provides similar impressive financial results for Zara. Among the myriads of financial metrics, *net present value* (NPV) is of most interest. Financial theory has established that the value of an organization is well approximated by its NPV, which is the present value of its future cash flows minus the investment today

<sup>2</sup>Both qualifiers are important. After all, copying is the only strategy needed to retain the status quo. Similarly, if one-time superior performance suffices, one can just harvest the organization and be done with it.

that is necessary to generate those future flows.<sup>3</sup> (Its calculation will be discussed in detail in chapter 3.) NPV recognizes the longer term and temporal character of many decisions, allows us to incorporate risk and uncertainty, and is more robust than most other metrics because cash flows are harder to manipulate.

The goal of strategy can now be summarized by our first principle, which will be our yardstick for designing, evaluating, and improving strategy throughout the book:

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**Principle 1 (Value Maximization)** The goal of strategy is to maximize the net present value of the organization.

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In a market economy, the classic reasoning behind this principle is as follows: Separation of ownership and control is essential for most corporations, so authority has to be delegated. Owners typically prefer more wealth to less but have different preferences regarding risk and how they ultimately want to consume that wealth. If owners have access to competitive capital markets, however, they can choose the risk of their consumption plan by investing in a portfolio of more or less risky securities. Managers then do not need to know the risk characteristics of the owners and should not consult their own risk preferences. Their task is to increase the market value of each owner's stake in the firm. Brealey and Myers (2000) summarize that "it is good to know that managers can all be given one simple instruction: Maximize net present value." (The authors also discuss whether managers actually do this and the ethical ramifications of such actions.) The value maximization principle extends to non-profit organizations when we interpret maximizing net present value to mean maximizing the value stream it provides to its customers given its budget constraint.

**Competitive strategy and the customer value proposition**

With its goal defined, strategy's remaining task is to articulate specific plans to maximize the net present value of the organization. Large organizations do this in a hierarchical manner and specify several levels of strategy. At the highest level, *corporate strategy* defines the industries in which the organization will be active, configures business units for each industry, and acquires and allocates corporate resources to each business. Corporate strategy is like portfolio management: choosing a mix of industries to participate in and allocating resources to each to maximize the value of the entire organization is similar to investing in a mix of financial assets. For example, Toyota Industries Corporation was founded in 1926 by Sakichi Toyoda to manufacture and sell the automatic looms which he had invented and perfected. Since then, Toyota Industries has promoted diversification and expanded the scope of its business domains to include automobiles (vehicles contributed 49.6% to FY2006 corporate sales, engines (8.8%), car air-conditioning compressors (14.3%), and others (1.8%)), materials handling equipment (39.5%), logistics solutions (4.3%), electronics and others (3.3%) besides textile machinery (3.3%).

<sup>3</sup>Some managers prefer to use the simpler financial metric of *economic value added* (EVA), which is the net operating profit after taxes minus the opportunity cost of invested capital. While the explicit inclusion of opportunity cost is appealing from an operations perspective (think of the opportunity cost of holding inventory or excess capacity) bear in mind that EVA only considers current profits. Given that it excludes future cash flows, it can only be a proxy for the value of an organization.

A business unit formulates its *business* or *competitive strategy* to seek “a favorable competitive position in an industry, the fundamental arena in which competition occurs. Competitive strategy aims to establish a profitable and sustainable position against the forces that determine industry competition,” according to Porter (1985). Competitive strategy uses two means to create sustainable value:

1. Choosing an attractive industry is the first fundamental determinant of a firm’s capability to provide value. “The essence of formulating competitive strategy thus is to relate a company to its environment.”[5] Porter’s five-forces framework analyzes industry attractiveness by studying the bargaining power of suppliers and buyers, the threat of new entrants and substitute products or services, and the rivalry among existing firms.
2. Choosing an attractive competitive position within an industry is the second fundamental means of providing value. Positioning can be described in terms of the *customer value proposition*, or a clearly articulated set of benefits that the firm offers to customers. Customers ultimately make purchasing decisions based on the benefits or the value they derive from the product or service relative to its price. This value can be summarized by a *reservation price* which is the greatest amount a customer is willing to pay. When value exceeds price, the customer enjoys positive net value or *consumer surplus* by acquiring the product or service. When offered choices, customers will often buy the service or product that offers them highest consumer surplus.

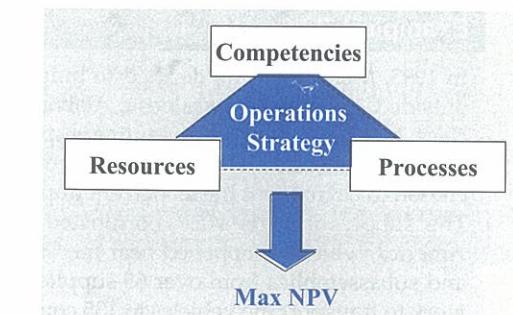
For example, Zara’s main business is the design, manufacture, distribution and retailing of clothing. It distinguishes itself from rivals by providing timely fashion for the masses. The customer value proposition thus emphasizes timely yet limited variety at modest cost and quality of materials.

To execute its competitive strategy, an organization further defines a financial strategy specifying how capital will be raised and invested; a marketing and sales strategy specifying how the market will be segmented and how the product will be positioned, priced, and promoted; and an operations strategy. To explain the latter, let us review what we mean by operations.

### Three views of operations

The word operations stems from the Latin verb *operari* and noun *opus*, which mean “(to) work.” Operations simply are activities, but it is typically understood that these activities are planned and coordinated and often involve a number of people. The Merriam-Webster (2007) dictionary says that an operation is “the performance of a practical work or of something involving the practical application of principles or processes.” From an academic perspective, *operations* is the study of work. Managers think of operations as the planning and execution of work, especially the creation and delivery of products and services.

When studying operations, it is helpful to adopt three different yet complementary views of operations. The resource view focuses on the assets used in the operation while the process view highlights the operation’s activities. The financial analogy is that the resource view focuses on the balance sheet while the process view shows how assets are used in the generation of income. The third view characterizes the competencies of the operations, i.e. what it can and



**Figure 1.1** Operations strategy is a plan for developing resources and configuring processes such that the resulting competencies maximize net present value.

cannot do. We will explain these views in greater detail soon but this suffices to finally define our topic of interest.

### The concept of operations strategy

We can now define the concept of operations strategy building on the meaning of its two elements, operations and strategy, as represented in Figure 1.1:

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**Operations strategy** is a plan for developing resources and configuring processes such that the resulting competencies maximize net present value.

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Operations strategy thus answers two questions:

1. What should operations be good at? Which competencies should it nurture?
2. Which operational system of resources and processes best provides these competencies?

Operations strategy is related to competitive strategy but has a distinct role. While competitive strategy is more about selecting industries and choosing the product attributes on which to compete, operations strategy focuses on enabling the execution of the business strategy—on how to best deliver the value proposition. For example, a competitive strategy for Toyota Motor Company was deciding whether to enter the full size pick-up truck market by launching the (upgraded) Tundra in 2007. Their operations strategy involved choosing assets and processes to best design, source, make, and distribute this new vehicle while developing competencies for future products.

Similarly, operations strategy relates to operations management but has a different focus, scope, and time scale. Operations management often means appropriately utilizing given assets and processes. Operations strategy focuses on

### Example 1.2 Mercedes-Benz AG

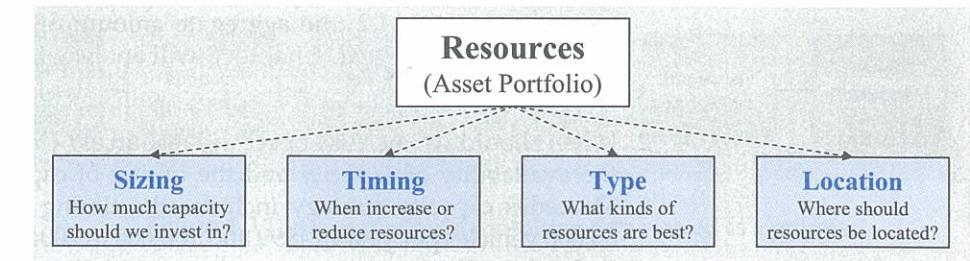
In 1993, Mercedes-Benz decided to build the first Mercedes-Benz passenger car factory outside Germany, in Tuscaloosa, Alabama. The plant was designed to produce the M-class, Mercedes-Benz's competitive response to the runaway success of the sport utility vehicles introduced by American car companies in the late 1980s. The U.S. location was chosen to circumvent the 25 percent import tariff on foreign-made pickup trucks. The supply of parts was coordinated by the Mercedes-Benz Consolidation Center-America, which was opened near the Tuscaloosa plant in Alabama to manage the parts and subassemblies from over 65 suppliers. Mercedes also developed a distribution network to transport the vehicles to 135 countries. The first M-class was sold in 1997 and actual demand quickly surpassed all forecasts and the annual production capacity of about 65,000 vehicles. The initial \$300 million plant was expanded in 1998 and 1999 to about 80,000 vehicles at a cost of \$80 million, but even that was insufficient. From 1999 to 2002, the M-Class was also produced by contract developer and manufacturer Magna Steyr in Graz, Austria (Magna Steyr is profiled in Example 7.6 on p. 265). Recently, DaimlerChrysler went through a similar process to decide on an operations strategy for the new R-class, featuring the Grand Sports Tourer. To prepare for the production of the R-class in Alabama, a \$600 million expansion in 2004 doubled the factory size, doubled the workforce to approximately 4000, and doubled its production volume to 160,000 vehicles per year. Source: Mercedes-Benz (1999)

developing assets and configuring processes. Consequently, it is less about immediate, specific issues and more about future, general issues. For instance, operations management in a retail bank includes scheduling employees at each local branch (over the day, the week, and the month) to assist customers with their savings and checking accounts, mortgages, personal loans, debit cards, credit cards, and so forth. It also involves managing, for example, check clearing and the daily flow of information and cash at the back office. Operations strategy, however, would include deciding on the division and coordination of labor and processing between the many branch offices and the few back offices; choosing locations and capacities; deciding which activities to outsource or when to form alliances at the retail level while perhaps vertically integrating at the back office; and building internal capabilities for information technology.

Mercedes-Benz provides another example of decisions involving operations strategy. At the beginning of the 21st century, it announced its plans to design, produce, and sell a new line of consumer vehicles, the R-class (Example box 1.2). To further understand the typical questions that operations strategy must answer, we must dive deeper into the three views of operations.

## 1.2 THE RESOURCE VIEW OF OPERATIONS

To coordinate and perform their activities, organizations need a wide variety of *real assets* or *resources*. We will make a distinction between real assets and *financial assets*. The terms real assets and resources refer to all the means needed to perform the activities excluding financial assets. To pay for the real assets, the



**Figure 1.2** The resource view suggests four key questions to characterize resource strategy.

corporation typically sells "pieces of paper called financial assets, or securities. These pieces of paper have value because they are claims on the firm's real assets and the cash that they produce" (Brealey and Myers 2000, p.5).

### Adopting a resource view

The *resource view* considers any organization (or any of its parts) as a bundle of real assets. Real assets are divided into two groups: tangible and intangible. Tangible real assets are human resources (people) and capital assets (property, plant and equipment as shown on the balance sheet). Intangible assets include relationships with suppliers or customers, intellectual property, reputation and brands, and knowledge and experience in processing, technologies, and markets. Often, tangible real assets "do" the work, while intangible assets embody the "know-how" to do the work.

In Example 1.2, Mercedes' bundle of real assets includes real estate in Alabama encompassing a plant with a variety of production and support equipment, such as presses, welding machines, and information systems, and staffed by 2000 employees. Its intangible assets include the supply base relationships it has formed, the process and product technologies that it employs, its knowledge of the local economic, legal, and social environment, its connections with logistics and transportation providers, and so on.

Viewing operations as a bundle of real assets is most useful when deciding on the amounts and types of resources the operation needs. This investment or capital budgeting decision, along with the allocation of resources to activities, is undoubtedly a major task of management. While this financing decision is the topic of the field of corporate finance and beyond the scope of what we will consider, resource investment and valuation of the operation in financial terms is also a key concern of operations strategy.

### Four key questions to determine resource strategy

An organization's resource strategy must answer four key questions, shown in Figure 1.2. Together, these questions characterize the *asset* or *capacity portfolio*:

1. How many resources should we invest in? The answer involves capacity sizing which determines the capacity, in aggregate and per main resource

type. In Example 1.2, the aggregate amount of capacity was originally 65,000 vehicles per year. Chapter 3 will analyze how to answer this question.

2. When should we increase or reduce resources? Capacity *timing* represents the availability of capacity and the timing of capacity adjustments. The Mercedes capacity strategy includes the timing of capacity expansions: 85,000 vehicles per year in 1999 and 160,000 in 2004. We study this question in depth in Chapter 4.
3. What kinds of resources are best? The capacity *type* characterizes the nature of each resource. For example, is it a human (labor) or capital resource? To what extent can a capital resource operate unsupervised; i.e., what is the level of automation? What is the range of tasks that it can handle, from single-task (specialized) to multi-task (flexible)? For example, how is the 160,000 annual vehicle capacity split into capacity for the M-class and the R-class, and into assembly of the various engine configurations? Are the assets specialized to produce only the M-class or flexible to also produce the R-class? Chapter 5 is devoted to answering such questions about resource type and flexibility.
4. Where should resources be located? The capacity *location* decision deals with finding appropriate geographical sites and assigning roles to them. For example, how should the M-class plant location be chosen and what responsibilities should it have? For our Mercedes example, the location is Tuscaloosa, Alabama, but it would also include other locations if we were to consider the larger Mercedes supply chain. Chapter 6 will examine location decisions, including offshoring.

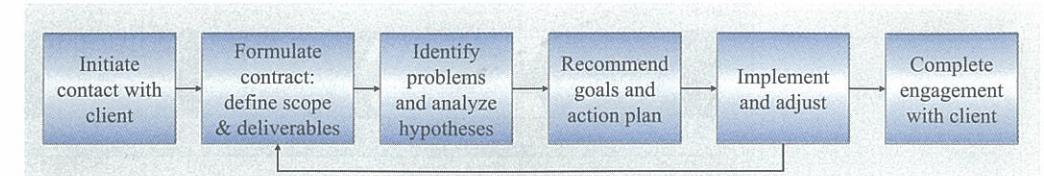
Indeed, location decisions are part of network strategy. Network strategy also includes topology or configuring connections between locations. For example, FedEx uses a hub-and-spoke or star topology for airplane routing, while most automobile companies use a tiered supply network or tree topology. Interconnections also specify the logistics (transportation) arrangements. Network strategy also specifies whether processes should be standardized or localized; e.g., should Tuscaloosa processes be similar to the German processes?

## 1.3 THE PROCESS VIEW OF OPERATIONS

The purpose of resources is to work and generate value. The process view highlights how resources perform activities and add value.

### Processes and activity networks

Processes are structured, recurrent activities that transform inputs into outputs. Some processes are well defined and documented, while others are less so and are called *routines* in everyday language. A process is also a network of activities



**Figure 1.3** The operations of a consulting firm viewed as a process.

with specific precedence relationships among the activities—the relationships that specify which activities must be finished before another activity can begin. For example, most management consulting firms follow a structured sequence of activities for each engagement as illustrated by the activity network as in Figure 1.3.

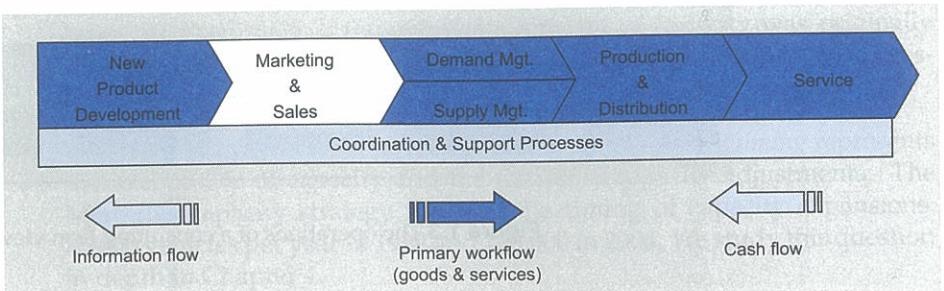
We will use the terms activity network, process, and routine interchangeably. These terms embody an element of repetition but focus on the positive aspects: “Practice makes perfect” and recurrent execution makes analyzing and improving operations a worthwhile investment. One can argue that most great human accomplishments—in the arts<sup>4</sup>, the sciences, sports, politics or economics—are the result of processes.

### Adopting a process view and value stream mapping

The *process view* considers an organization (or any of its parts) to be an activity network or a collection of processes. A process can refer to detailed workflow, such as billing a customer or implementing an engineering change order, or to aggregate activities such as new product development or customer service. Adopting a process view means that we visualize instances of work, which we will call *flow units* (e.g., consulting engagements, patients, or orders), flowing through a network of activities. This *primary work flow* is typically accompanied by an *information flow* to coordinate the activities and a *cash flow* to support and reward them. *Flow charts* such as Figure 1.3 and *value streams* or *chains* are graphical representations of the process view of an organization. The value chain of Figure 1.4 shows the typical business processes found in most organizations.

Many organizations tend to focus on a subset of the typical business processes shown in Figure 1.4. For example, design companies such as Ideo help other companies innovate by designing products, services, environments, and interactions. Supply, demand and distribution management are the core activities of retailers, while on-going client service is a key activity in brokerage and corporate information services. Service and customer relationship management can also be an important process for product companies. For example, once a

<sup>4</sup>For example, Peter Paul Rubens, the Flemish painter from Antwerp (1577-1640), followed a well-defined process to conceive his art. Rubens started with a rough ink sketch, which he subsequently developed into a drawing or oil sketch. He refined the sketches into detailed drawings for which live models assumed the required poses. Then, guided by the sketches and detailed drawings, apprentices would paint in. Finally, “Rubens would come in at the end to touch things up (adjusting the price depending on how much he contributed),” according to Kimmelman (2005). He called Rubens “ridiculously gifted” and his process “Baroque art’s luxury version of an assembly line, albeit an assembly line overseen by a genius, who employed assistants who were geniuses, too, like Anthony van Dyck.”



**Figure 1.4** The value chain is the graphical representation of the process view an organization. The primary workflow is typically accompanied by an information and cash flow.

customer has bought a Mercedes, s/he will be constantly updated on new product introductions and promotions as part of "the Mercedes-Benz experience."

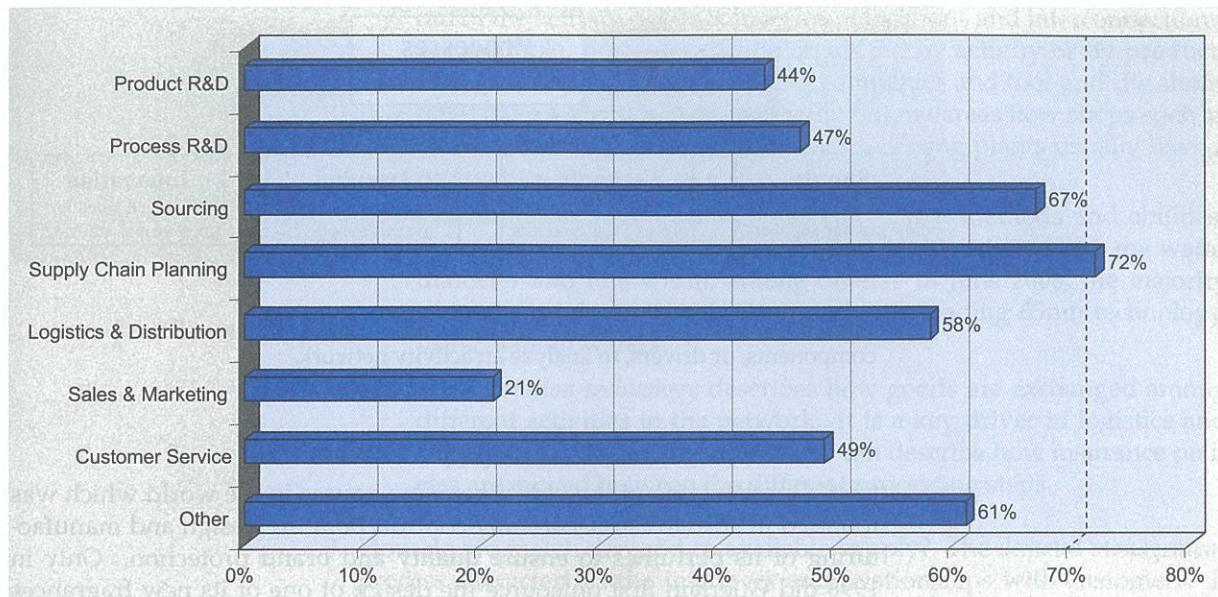
#### The benefits and importance of a process view

By necessarily starting with inputs (expressed customer demands) and ending with outputs (served customer demands), the process view is compatible with a customer-centric view of the world. Value stream mapping emphasizes this customer-centric view and defines value from the perspective of the customer: a value-added activity is an activity that benefits the customer.

The process view is a horizontal view of the organization that cuts through functional silos such as finance, accounting, production, marketing and sales. It emphasizes crucial inter-functional relationships among internal parties, as well as the interfaces and relationships with external customers and suppliers. By equating organizations with processes, the *business process reengineering* paradigm of the early 1990s has put operations on the agenda of top management at many organizations. By capturing both *structure* (or *architecture* or *design*) and *execution*<sup>5</sup>, the process view is useful for analyzing the division and specialization of work following the dictum of Adam Smith, as well as for coordinating and evaluating execution. For example, how is the auto manufacturing process divided and coordinated between the original equipment manufacturer (OEM) and its suppliers? Given a process structure, what is the total marginal cost of the car manufacturing process from inputs to a finished vehicle? How long is an average consulting engagement from start to completion?

The process and resource views are complementary: the process view focuses on how work is done, while the resource view focuses on *who* or *what* performs the work. Both are necessary to understand operations well: Viewing the firm as a sequence of activities without considering its resources gives as incomplete a picture as viewing the firm as a collection of resources without considering how those resources are put to use. For example, the performance of

<sup>5</sup>Some authors differentiate between those two notions by using the word network to refer to the architecture or design of the operation, and management to mean execution. For example, the supply network would refer to the set of and the relationships with suppliers whereas supply management would refer to the way suppliers are handled.



**Figure 1.5** Operations strategy leaders do much more than production: they manage the value chain (Fig. 1.4). Note: Multiple responses possible. Source: von Hochberg, Rodrigues, and Grenon (2006).

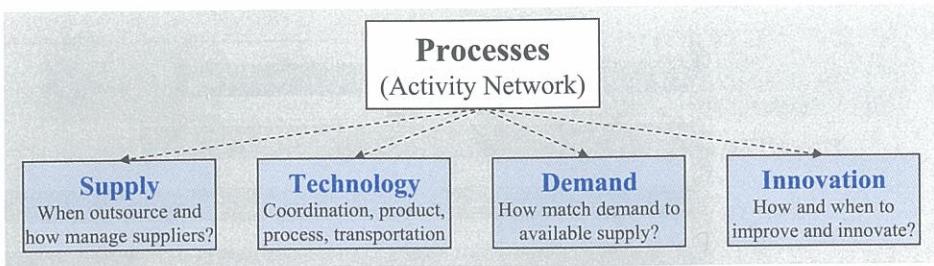
a consulting company obviously depends on how it structures its activities, but also depends on the type and quantity of resources it allocates to those activities.

Operations leaders apply the process view and manage the value chain. Indeed, a survey by Booz Allen Hamilton shows that operations leaders manage much more than just production, according to von Hochberg, Rodrigues, and Grenon (2006). The bars in Figure 1.5 show the percentage of survey respondents who manage domains besides production, including more than 40 percent who oversee customer service and R&D.

#### Four key questions to determine process strategy

An organization's process strategy must answer four key questions, shown in Figure 1.6, that describe how we deal with the inputs, internal processes, outputs, and the future of each major customer-to-customer value stream:

1. Which activities do we perform internally, which are outsourced, and how do we manage suppliers? The *supply* or *strategic sourcing* process characterizes the interfaces and relationships with suppliers. Chapter 7 will analyze strategic sourcing decisions such as outsourcing (which activities are provided by third parties?), vertical integration (how far do we extend our activities upstream and downstream?), and supply network configuration (how many suppliers do we use and have relationships with?). For example, Mercedes owns engine plants, but outsources seat manufacturing and transportation within its production and distribution network. In con-



**Figure 1.6** While processes have many facets, our process view will use four components, or drivers, to analyze an activity network.

trast, Guerlain, one of the oldest perfume houses in the world which was founded in 1828 in Paris, carefully controls both the design and manufacturing of its perfumes to ensure quality and brand protection. Only in 1998 did Guerlain first outsource the design of one of its new fragrances (Champs-Elysées).

2. Which technologies do our processes need? *Technology* characterizes how we process inputs to outputs. It includes the methods and systems employed, as well as the know-how and intellectual property. We will focus on four types of technology:

- Coordination and information technology* describes how we coordinate, communicate, and plan execution throughout the activity network. It lies at the core of modern banks for which timely information sharing and processing is paramount. Coordination is a typical managerial activity and includes the assignment of responsibility, incentives, measurement, and control. For example: do we have tightly centralized or distributed control? The supply of parts to Tuscaloosa is coordinated by the Mercedes-Benz Consolidation Center-America. Coordination is obviously important during planning. For example, managers often fail to coordinate financial forecasts, sales forecasts, marketing forecasts and operations forecasts. Collaborative planning and forecasting systems aim to correct this mistake. Coordination is equally important during execution: much of the challenge in managing operations is making events happen at the right times. Finally, coordination strongly depends on information technology such as communication technology (e.g., Internet, radio frequency identification RFID) and planning systems (e.g., enterprise resource planning ERP).
- Product technology* describes the design philosophy, product architecture, and product capabilities (often as perceived by the customer). For example, is an M-class sport utility vehicle designed in modules or as a single integral system? To what extent does the design take into account manufacturability, testability, or reusability?
- Process technology* describes the structure of the conversion process and methods used in its execution. *Network structure* describes the lay-

out of the activity network in terms of locations and interconnections. For example, processes can be organized by activity or by product-line. Job shops such as consulting companies and tool-and-die shops often have a functional or process layout, whereas flow shops such as auto assembly plants and chemical processing plants usually have a product layout.

Process technology also includes conversion methods and abilities. For example, a semiconductor process is characterized by the wafer diameter and line width, among others. In June 2006, the majority of Intel's products were built on industry-leading 65nm technology, using 300mm wafers.

- Transportation technology* describes how goods are exchanged among different activities in the network. It is a key driver in logistics and supply chain management, but also can describe how insurance policies are moved between the different processing steps.
- How do we match demand to available supply? The *demand management* process characterizes the interfaces and relationships with customers. It includes demand planning and forecasting as well as tactical capacity allocation and order management. Demand management is an important driver in inflexible supply processes that cannot quickly adapt to changes in demand such as the core processes in airlines, hotels, and car rental companies. It also relates to *service* and *customer relationship management* (CRM), which are the processes involving any follow-up interaction with customers. We study demand and revenue management in Chapter 8.
- How and when do we improve and innovate? *Improvement and innovation* characterize the processes and incentives to improve and innovate products and processes. It not only involves research and development activities, but also broader continuous improvement and learning throughout the organization. Chapter 6 will examine location decisions, including offshoring. Chapter 10 will examine improvement and innovation.

## 1.4 THE COMPETENCY VIEW OF OPERATIONS

The ensemble of resources and processes, which we will also refer to as the *operational system*, affects what an operation can and cannot do. This operational system together with the vaguer, but at least as important, concept of values characterize the competencies of the organization.

### Values: operations' decision priorities

Besides resources and processes, values are a third factor that affect what an operation—and thus an organization—can and cannot do. Following Christensen and Overdorf (2000), we define *values* as the standards by which employees set priorities. Sure, some priorities are embodied or “programmed” into a process

but many are not, even though prioritization decisions are made by employees at every level. Examples include judging whether an order or customer is attractive or not, whether a suggestion to improve a product or process is attractive or marginal, and whether an investment is worth making or not.

As organizations become more complex, consistent values are powerful mechanisms for employees to make independent but consistent decisions about priorities. As successful companies mature, “employees often start believing that the processes and priorities they have often used so successfully are the right way to do their work. Once that happens and employees begin to follow processes and decide upon priorities by assumption rather than by conscious choice, those processes and values come to constitute the organization’s *culture*. (Christensen and Overdorf 2000)

### Adopting a competency view

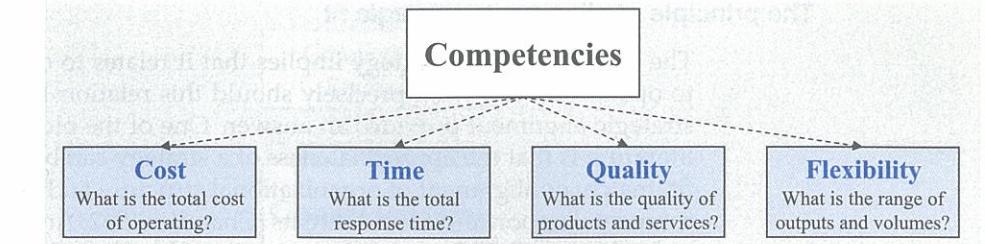
The competency view characterizes the abilities of the ensemble of the organization’s resources, processes, and values. Competencies determine the set of outputs, products, and services that the operation will be particularly good at providing. For example, a premier management consulting company is good at providing high quality customized advice. An efficient operation such as McDonald’s is good at delivering inexpensive food quickly, but from a standard and limited menu with a well-defined quality level. Zara, described in Example 1.1, is good at quickly delivering a large selection of new designs at a reasonable cost.

Where competencies reside changes over time: they start in resources, gradually migrate to processes, and eventually reside in values. Most of what gets done in start-up companies is attributable to resources, especially its people. Losing a person can be detrimental. As activities become more recurrent, processes are defined. As it becomes clear which business needs should be given highest priority, values emerge. Competencies then are rooted in well defined processes and values, and eventually reside in culture, rather than in resources. Processes and values then make organizational performance robust to changes in its resources. Even with hundreds of new recruits and departures per year, top management consulting companies remain successful because their processes and values are so strong that project staffing changes have little impact.

### Four key questions to determine competencies

To determine an organization’s competencies one can ask four questions, as visualized in Figure 1.7:

1. What is the total *cost* of operating, including variable and fixed costs? Cost is particularly important in competitive markets such as commodities and low margin businesses.
2. What is the total response or lead *time*, the time needed to transform inputs into outputs? Responsiveness is important in service and convenience-driven businesses, as well as in rapidly changing environments.
3. What is the ability to deliver *quality* outputs? Quality refers to the degree of excellence of the process, product, or service. It has design-related dimensions such as performance and features, as well as process-related di-



**Figure 1.7** The competency view characterizes the abilities of an operation. Time, quality and flexibility are dimensions to differentiate from cost.

mensions such as durability and reliability. Quality is a key differentiator in luxury and high precision businesses.

4. What is the operations’ *flexibility* to change inputs, activities, volumes, or outputs? Similar to quality, flexibility has several dimensions such as scope flexibility (the selection or range of products and services offered, including the level of customization), volume flexibility, and robustness, as we will see in Chapter 5.

The resource, process and competency views provide a 360-degree perspective on operations. The competency view is the most “outward-looking” and begs the important question: *which* competencies should an operation have or develop? This naturally connects to competitive strategy, which directly inspires our framework.

## 1.5 | A FRAMEWORK FOR OPERATIONS STRATEGY

In principle, operations strategy could emerge from a giant optimization program that automatically identifies the resources, processes, and competencies that maximize net present value. In practice, however, this quantitative approach cannot yet (and likely never will) formulate comprehensive strategies: the search space of all possible resource, process, and competency configurations cannot easily be represented mathematically, let alone be summarized into one financial measure that can be optimized.

Operations strategy therefore starts with qualitative arguments to characterize the appropriate types of resources, processes, and competencies. Subsequently, if more specificity is needed or desired, the value maximization principle can be used to optimize over that restricted search set. (We will use financial optimization to inspire optimal partial operations strategies such as optimal capacity and flexibility strategies later in this book.)

A key qualitative argument is provided by the principle of alignment or strategic fit, which is at the foundation of our operations strategy framework.

### The principle of alignment: strategic fit

The term operations strategy implies that it relates to competitive strategy and to operations. But what precisely should this relationship be? The principle of strategic alignment provides an answer. One of the oldest ideas in the strategy literature is that the appropriateness of a strategy can be defined in terms of the fit, match, or alignment of organizational structure and resources with the environmental opportunities and threats (Chandler 1962; Andrews 1971). It gave rise to the famous SWOT approach to strategy: identify and align your strengths and weaknesses with the environmental opportunities and threats. In our setting, we can paraphrase this idea as:

**Principle 2 (Alignment)** Operations strategy should develop resources and configure processes such that the resulting competencies are aligned with the competitive position that a firm seeks over time.

The principle of alignment extends to the entire organization. McKinsey consultants Drew, McCallum, and Roggenhofer (2004) argue that the operating system must be aligned with what they call the *management infrastructure* (meaning organization, leadership, and performance systems) and the mindsets and behaviors (meaning values) of the organization. You may think of the operating system as the engine of a car: as high-powered as it may be, it won't go in the right direction without the appropriate dashboard information systems and a willing driver.

### A framework for formulating operations strategy

The principle of strategic fit directly inspires a framework for formulating operations strategy that is represented visually in Figure 1.8. It can be thought of as answering three types of questions:

1. How does the organization seek to compete and provide value to its customers? For each targeted customer segment, how is the customer value proposition prioritized around cost, time, quality, and variety?
2. What must operations do particularly well? For each targeted customer segment, how are the operations' competencies prioritized around cost, flow time, quality, and flexibility?
3. Which resources and processes best provide that competency prioritization? For each targeted customer segment, how are the asset portfolio (sizing, timing, and location of each resource type) and the activity network (supply, technology, demand, and innovation management) configured?

The idea is that by answering these questions, a *tailored operational system* emerges: its resources and processes are configured such that its competencies best fit the customer value proposition specified by the competitive strategy. The sequence in which these questions are answered reveals a different perspective on operations strategy.

The *market perspective* first decides on competitive strategy and then specifies the competencies that operations strategy must develop by selecting and configuring the appropriate resources and processes. Behind this perspective is the

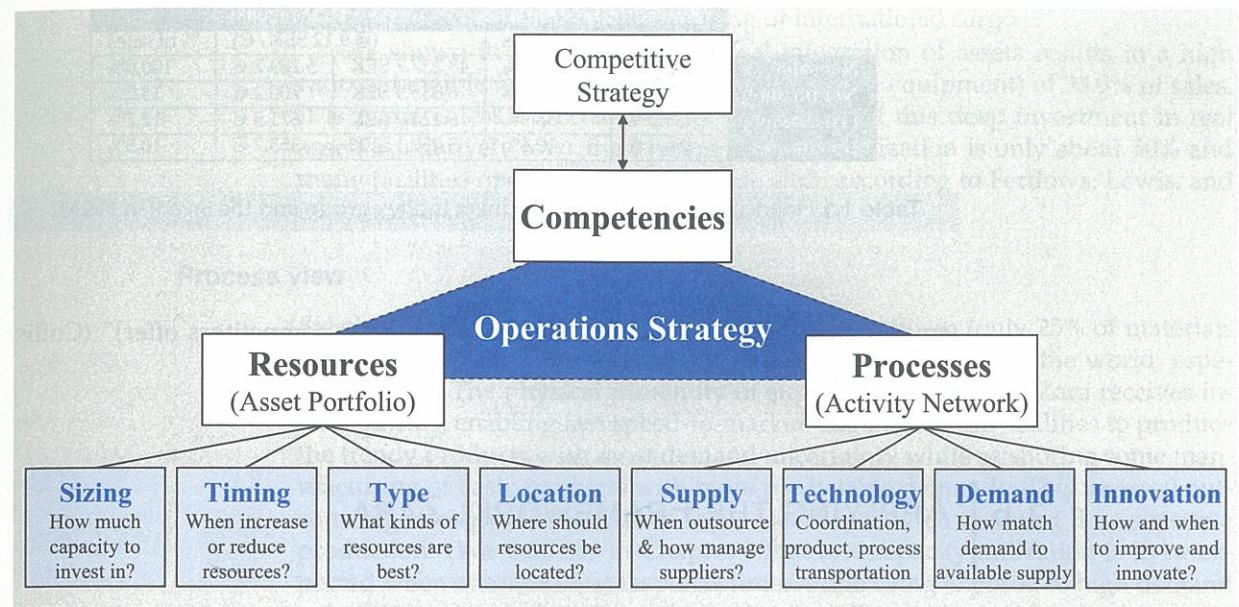


Figure 1.8 A framework for formulating an operations strategy.

premise that "structure follows strategy," as strategy-pioneer Chandler (1962) summarized in his book *Strategy and Structure*. This "top-down and outside-in" perspective ensures that operations and all parts of the organizations reflect the intended market position, and tends to create a customer-driven organization. For example, consumer goods companies such as Procter & Gamble and General Mills often let market research drive their strategies for new products and associated operations. Customer feedback strongly guides P&G's choice and improvement of its antiperspirant scents and product designs.

The *resource & process perspective* approaches the framework in the reverse sequence. This bottom-up and inside-out perspective starts from the premise that the building blocks of strategy are not products and markets, but processes and resources. "Competitive success then depends on transforming a company's key processes into strategic capabilities that consistently provide superior value to the customer." (Stalk, Evans, and Shulman 1992) This perspective ensures that the value proposition offered to customers can be well executed with the given operations. It tends to create a resource-driven organization, such as Honda. Honda's abilities and knowledge in engine technology is legendary and has been the driving force in deciding which markets to enter and which products to offer: it has entered markets that need a product with a high-performance engine.

As environments, strategy, and operations evolve, organizations must seek to maintain alignment by adopting both perspectives over time. In order to satisfy a new customer need, the firm may need to build new competencies, processes, and resources. Those processes and resources may later be used to invent new products and services that may drive, if not create, new markets. From this dual perspective emerges an operations strategy that "inextricably links a company's internal competencies (what it does well) and its external industry

Zara's Inditex (2003)		H&M (2003)		
	% of sales	(@ 9.12 SEK/€)	% of sales	
Net sales	4,598.9 €	100,0%	48,237.7 SEK	5,289.2 €
Net income	446.5 €	9.7%	6,385.9 SEK	700.2 €
Fixed assets	1,559.2 €	33.9%	6,124.0 SEK	671.5 €
Inventories	486.4 €	10.6%	5,050.1 SEK	553.7 €
				10.5%

**Table 1.1** Financial summary of the Spanish Inditex group and the Swedish H&M.

environment (what the market demands and what competitors offer)" (Collis and Montgomery 1995).

## 1.6 | APPLYING THE FRAMEWORK: ZARA

Let us illustrate the framework in the setting of Zara.

### Competitive strategy and the operational competency view

According to Example 1.1, Zara aims to distinguish itself in the eyes of the consumer by providing fast fashion and "cheap chic" styles. The value proposition thus seems to prioritize speed and selection, while keeping cost and quality comparable to that of competitors. In other words, selection and speed are the *order winners*, while cost and quality are necessary qualifiers to be in the game. Consequently, to execute this value proposition, its operations must be especially good at bringing many new styles quickly from design to retail shelves. Recall that 11,000 new styles per year are introduced and some of them within a three week design-to-rack time.

What makes Zara interesting from an operations standpoint is how it has configured its operational system to pull off such variety and speed, while keeping costs and quality reasonable. Let us now turn to Zara's resources and processes for new product design, manufacturing, and distribution.

### Resource view

Zara's short design-to-rack times require short conversion times in, and immense coordination among, all major activities in the value chain. Consequently, Zara's operations strategy is characterized by high vertical integration because ownership allows tight coordination. Its capacity portfolio includes a design center, some manufacturing facilities (it also outsources manufacturing locally), two major distribution centers, as well as a controlling interest in 90% of the retail network (only 10% of its 724 stores are franchised). The design capacity of 11,000 new styles per year by its creative teams, made up of over 200 professionals, is in line with the timely fashion that Zara promises. Zara owns two central warehouses, both in Spain. The recent 123,000m<sup>2</sup> distribution center in Zaragoza has a distribution capacity of 80,000 garments per hour. It came on-line in fiscal year 2003 and has direct access to the highway and railroad network. Its proximity to

Zaragoza's airport favors fast handling of international cargo.

As shown in Table 1.1, the vertical integration of assets results in a high ratio of tangible fixed assets (property, plant, and equipment) of 33.9% of sales. It is perhaps less expected that the utilization of this deep investment in real assets is relatively low: the average capacity utilization is only about 50% and many facilities operate for only a single shift, according to Ferdows, Lewis, and Machuca (2004).

### Process view

**Supply.** Zara's supply network is concentrated in Spain (only 25% of materials are sourced from the rest of Europe and 25% from the rest of the world, especially Asia). The physical proximity of suppliers ensures that Zara receives inputs quickly, enabling fast speed-to-market. Zara uses local facilities to produce the trendy products with most demand uncertainty while offshoring some manufacturing of basic products with more predictable demands. This targeted outsourcing strategy allows Zara to focus local capacity on the most time-sensitive production. (We shall see in Chapter 3 that low capacity utilization is to be expected when one seeks fast response times while being exposed to high demand volatility.)

**Technology.** Zara's process technology can postpone the dyeing of fabric: almost half the raw materials are purchased undyed (and sometimes so early that designs must be adapted to use them, as with silk from China). Local manufacturing processes have short setup times and run in small batches, while offshore manufacturing of more predictable demand can have longer lead times (Zara is said to have employed Toyota engineers to design its manufacturing and distribution system). Distribution is highly centralized to reduce the number of stocking points and the associated handling time and so that one store's upside demand fluctuations can offset another's downside. The hub and spoke delivery system uses the most appropriate transportation mode (truck, rail, or air) depending on the store location and the time-sensitivity of the product. It provides frequent deliveries (Thursday delivery is important in the fashion industry) with short lead times for reordering. This approach maximizes the flexibility of inputs and increases responsiveness while controlling working capital (inventory). Information technology enables the daily information flow between store managers, requesting products and providing customer preference feedback, and design and production sharing information on upcoming products.

**Demand.** Intentionally short style campaigns that are likely to run out of stock create a scarcity image. Customers visit stores frequently and are likely to buy what is available at that moment because that particular product may no longer be available next time. The combination of short campaigns and limited inventory reduces markdowns and leftovers.

**Innovation.** Fast new product design is a key enabler of Zara's strategy. Ideas inspired by urban hot spots, fashion shows, and store customers are transmitted to the creative teams. Design style platforms are created ahead of the season and are modified just before production based on feedback from retailers to incorporate the "concerns and demands of the public," i.e., the most recent fashion. This postponement of design styling requires fast and efficient information transfer, which is facilitated by organizing the creative teams by design styles (product-layout).

A firm believer that “people, cultures and generations, in spite of their differences, share a special sensitivity for fashion,” Zara standardizes a majority of its designs but allows some adjustments to local taste. For instance, Zara originally insisted on a standard set of sizes for all countries but had to add smaller sizes for Japan and larger ones for the U.K. and Germany.

In conclusion, Zara has tailored the eight drivers of its operations strategy to its fast-fashion, cheap-chic value proposition.

### Applicability of the Zara model: Should every retailer adopt it?

While Zara’s operational system fits its competitive strategy well, it is not a panacea. A counter-example is the operational system of Sweden’s Hennes & Mauritz AB, which operates the H&M clothing chain. H&M competes with Zara but has less of an emphasis on “new style velocity:” it produces much fewer new styles per year with a much slower design-to-rack time of 16 weeks, according to Tagliabue (2003). Without the stringent speed requirement, however, H&M has more leeway in configuring its operations which allows more outsourcing and higher capacity utilizations resulting in much lower fixed capital requirements. The lower safety capacity and responsiveness of the operating system is replaced by higher safety stock to buffer demand uncertainty.<sup>6</sup>

The Zara model is not used in other industries such as toy (e.g., Mattel, Inc.), cell phone (e.g., Nokia), or auto manufacturing. The reason may be that they lack a necessary condition for the Zara model to be profitable. Indeed, our analysis suggests that, at a minimum, a profitable application of the Zara model requires:

1. High customer willingness to pay for speed-to-market.
2. Short product life cycles with high demand uncertainty.
3. Low cost of excess capacity with low importance of scale economies.
4. Low cost of stockouts and distribution relative to inventory holding.

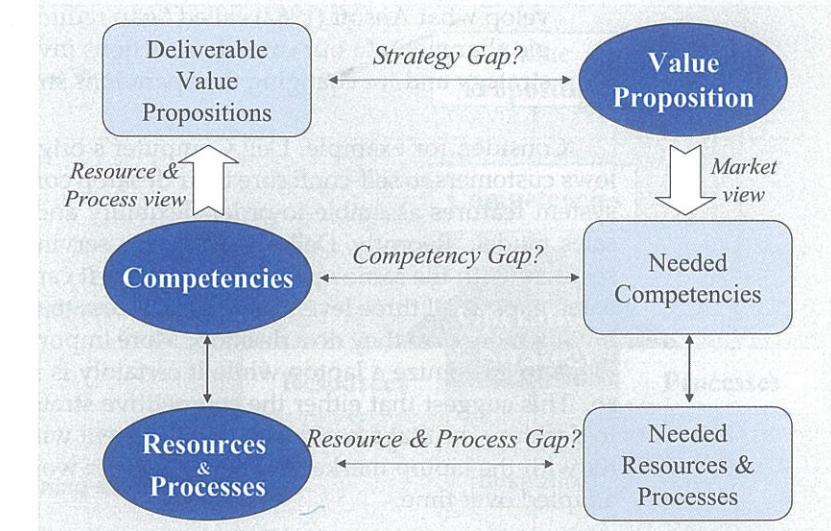
This reinforces this chapter’s main message: great operations strategies are tailored to each company’s strategy. While companies may share some elements, a complete tailored operations system is unique (to the extent that its strategy and industry are unique).

## 1.7 THREE TOOLS TO TAILOR OPERATIONS

Tailoring is the technique of fitting the operational system to competitive strategy. It is diametrically opposed to the idea that there is a “one best way” to configure *any* operation, to borrow Frederick Winslow Taylor’s words.<sup>7</sup> Rather,

<sup>6</sup>How would you mesh the claim that H&M has higher safety stock with the data of Table 1.1? Chapter 5 will explain it in terms of pooling.

<sup>7</sup>While Taylor’s achievements are impressive, they did not include the idea of tailoring (despite the resemblance in names). Skinner (1969) is widely credited for drawing attention to fitted operational systems.



**Figure 1.9** The strategic operational audit is a gap analysis to assess the degree of alignment and to develop improvement actions.

the best operations configuration depends on the mission of the organization. Given the daunting objective of tailoring, calling it a “technique” is not doing it justice: there is no simple recipe to tailor the entire operational system. Indeed, in a certain sense, this entire book is devoted to techniques for tailoring each driver of the framework. Nevertheless, the framework directly inspires a few guidelines to tailoring.

### The strategic operational audit

A *strategic operational audit* “takes stock” of an organization’s operation to assess its degree of fit with competitive strategy and to identify where improvements can be made. It consists of applying the top-down and bottom-up perspectives simultaneously and can be performed in three steps, as shown in Figure 1.9:

1. Start by understanding your customer and enunciating your competitive strategy in terms of the promised customer value proposition. Examine (audit) the current operational system: its resources, processes, and competencies. This step is represented by the three ovals in Figure 1.9.
2. Next, apply the resource & process views (bottom-up) to characterize the set of value propositions that current competencies can support well. Similarly, adopt the market (top-down) perspective to specify the competencies, as well as the best-aligned processes and resources, needed to execute the current competitive strategy. This second step is represented by the three rectangles in Figure 1.9.
3. Finally, assess the gaps between the current state and where we should be to ensure strategic alignment. Based on this assessment, we then de-

velop what Ansoff (1962) called “gap reducing actions” to improve strategic alignment. In our case, these actions involve changing the competitive strategy and/or changing the operations strategy.

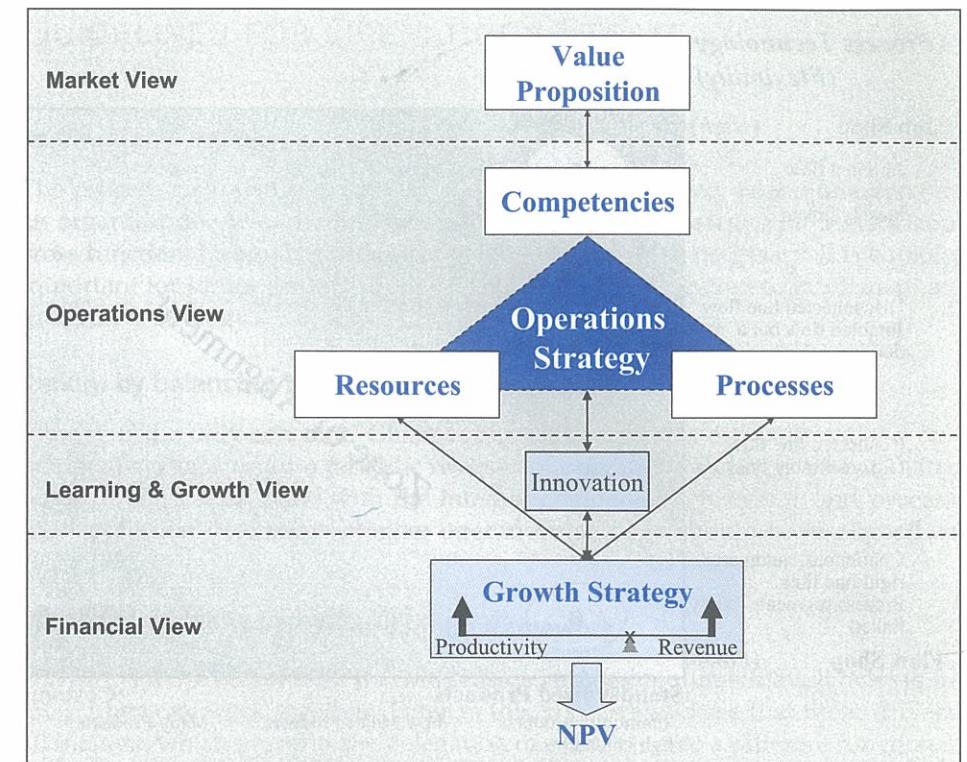
Consider, for example, Dell Computer’s original value proposition that allows customers to self-configure their desktop computer. Its aligned operational system features assemble-to-order flexibility and a quick response by a direct sales model. Recently, Dell also has been serving a growing laptop computer segment with the same operational system. It can be argued that this has led to some gaps at all three levels: customers seem to value touching a laptop before buying more than they do a desktop. More importantly, there seems less need or value to customize a laptop while it certainly is more difficult and costly to do so. This suggests that either the competitive strategy should be re-focused back to desktops, or that a new operational system with less flexibility would fit better with the laptop market segment. In other words, alignment may need to be adapted over time.

#### A balanced scorecard map

“The formulation of great strategies is an art, and it will always remain so. But the description of strategy should not be an art,” according to Kaplan and Norton (2000). These pioneers of the balanced scorecard measure a company’s performance from four major perspectives: market, internal operations, learning and growth, and financial view. They present a balanced scorecard map as a tool for organizations to communicate both their strategy and the processes and systems that will help them implement that strategy. They argue that such maps are needed, especially in the information age as organizations create an increasing proportion of value from intangible assets.

Adding the financial view (using the value maximization principle) to our framework yields the balanced scorecard map shown in Figure 1.10. This map can be used to communicate and integrate an operations strategy with the firm’s financial and competitive strategy. The balanced scorecard tends to emphasize the learning and growth view and represents our earlier innovation lever as a separate view. The financial view specifies how the organization seeks to increase its net present value from a financial perspective. Given that NPV is the present value of the stream of future profits, the two financial levers are to increase revenues or decrease costs. The growth strategy must define its desired balancing point (represented by the “x” in Fig. 1.10) between emphasizing productivity or revenue growth.

Filling out this map, in addition to its use as a means of communication, may provide a useful exercise for an organization to distill its often implicit operations strategy. Kaplan and Norton (2000) provide the following evidence why constructing these maps is a useful team exercise. While the value proposition is key to competitive strategy, “approximately three-quarters of executive teams do not have consensus about this basic information.” Similarly, they “readily acknowledge the importance of the learning and growth perspective, but generally have trouble defining the corresponding objectives.” There is great power in team conversation and exercise. Describing operations using a balanced scorecard map has similar advantages to drawing process flow charts: it opens our eyes to obvious misalignments and brings out the best in us to improve alignment and coherence in the organization.



**Figure 1.10** A balanced scorecard map for operations strategy.

ment and coherence in the organization.

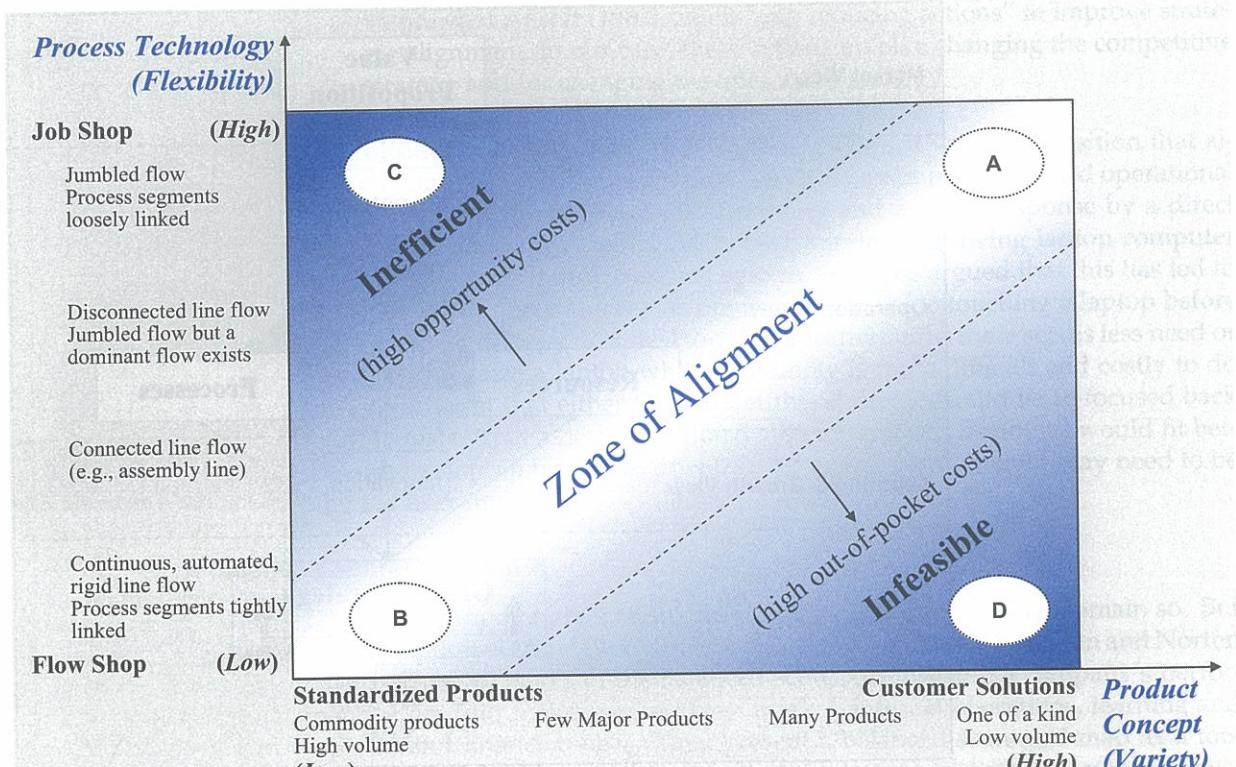
#### The product-process matrix

Whereas the strategic operational audit and the balanced scorecard are high-level tools for improving fit, the *product-process matrix* focuses on the match between process technology and delivered product attributes.

As shown in Figure 1.11, the product-process matrix starts by evaluating the promised value proposition (or the product concept on the horizontal axis) and the process used to deliver value (on the vertical axis). It verifies alignment along one dimension, often by comparing the degree of variety in the value proposition with the degree of process flexibility. This product-process combination is then represented by a colored area in the matrix where the distance to the diagonal represents the degree of misalignment.

Tailored operations occupy the diagonal, which is the “sweet spot” of alignment. For example, the tailored operation for highly customized products and services (“customer solutions”) requires a flexible process such as a job shop; this product-process combination is represented by position A in Figure 1.11. Top restaurants with three Michelin stars<sup>8</sup> fall in this category: they provide a con-

<sup>8</sup>The Michelin® guide awards up to three stars to the finest restaurants in Europe. Excellent restaurants receive one star. Two stars stand for a sophisticated and fine cuisine that deserves a detour. Exceptional cuisines that are worth a journey receive three stars. And exceptional they



**Figure 1.11** The product-process matrix is a tool to verify the degree of alignment between the product concept and the process technology.

tinually changing culinary experience for a select set of customers. In contrast, the tailored operation for standardized products such as high-volume commodity products is an efficient, highly-engineered process (position B). An example is the Chipotle chain of McDonald's owned restaurants: "Few restaurant chains can take it to the limit as well as Chipotle ... They make two things—burritos and tacos—very well", according to BestBite (2004).

Positions outside the diagonal signal misalignment. For example, three-star chefs who perpetually serve simple meals consisting of only burritos and tacos with their highly flexible job shop service process incur high opportunity costs (position C). Substantial savings would result from changing resources (including chefs) and streamlining the process into a flow shop. In contrast, asking Chipotle's process to change its menu daily would require high changeover costs. Asking it to deliver a three-star dining experience is virtually impossible (position D).

are: out of the 3,400 restaurants evaluated in the 2005 Michelin guide for the Benelux, only five restaurants (three in Belgium and two in the Netherlands) received the coveted three star status.

## 1.8 GUIDELINES FOR OPERATIONS STRATEGY

### Use a cross functional team with top-level involvement

The process view reminds us that operations touches upon all the functions in an organization. To formulate an effective operations strategy, it follows that a cross functional team that is familiar with all functions is necessary. It is equally important for senior leadership to be involved and committed to implement an integrative strategy.

### Adapt alignment by balancing the market view with the operational view

Change is the only constant. Changes in customer needs, competition, and operational systems require periodic reviews of operations strategy. By balancing the external market view with the internal competency, resource, and process views, one can determine whether operations strategy should be re-aligned or adapted.

### Tailoring operations involves all drivers in the framework

Aligning an operation with its competitive strategy requires that all drivers in the framework work together. Later in this book we will see that these drivers all interact, which prevents the delegation of each driver to a different functional manager. A horizontal approach is necessary and starts with the three qualitative tools from the previous section. Don't forget to also align the leadership infrastructure (metrics and incentives) as well as people's mindsets and behaviors.

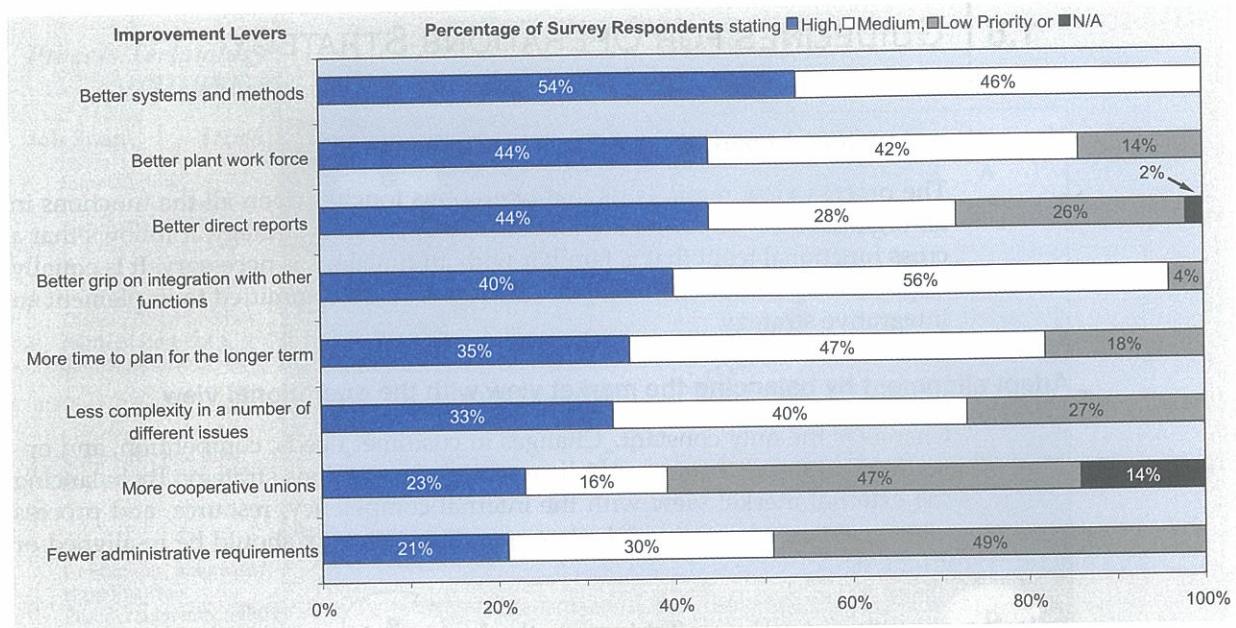
### Employ a qualitative approach first and refine this using a quantitative approach

Operations strategy is not an exact science; it requires judgment, experience, creativity, and luck. A qualitative approach is the typical way to start to formulating operations strategy. It also is the natural way to deal with people, a key improvement lever as shown in Figure 1.12. A quantitative approach then follows to refine and optimize, as we will do in the subsequent chapters to improve systems and methods; integration; planning; and reduce complexity. We thus aim to discuss most of the improvement levers in Figure 1.12.

## 1.9 SUMMARY OF LEARNING OBJECTIVES

### 1. Explain the concept of operations strategy and discuss its impact on an organization.

Strategy is a plan to reach a particular goal. For corporations, the value maximization principle specifies that goal as maximizing their net present value. Competitive strategy seeks to accomplish this by deciding which markets to enter and which value proposition to offer to its customers. This value proposition



**Figure 1.12** The typical improvement levers through which operations leaders create value, according to von Hochberg, Rodrigues, and Grenon (2006).

can be described by ranking the four dimensions of customer need: price, quality, responsiveness, and variety. Operations strategy is a plan for developing an operational system with competencies that maximize net present value. Integral to that plan is structuring interfaces with input and output, and capital and labor markets.

## 2. Adopt three complementary views to describe operations.

To describe operations, or the performance of work, it is helpful to adopt three complementary views. The resource view considers operations as a bundle of real assets. These tangible and intangible assets are the means of performing work. Deciding on the asset portfolio involves an investment decision. The firm finances this investment by selling financial assets, which are claims on the real assets and their cash flow. The process view highlights that operations are structured and coordinated networks of activities. The process view, which is graphically represented via a flow chart or value stream, takes on a horizontal, customer-centric perspective that is most useful for analyzing how the organization divides and coordinates work and produces value. The third perspective is the competency view, which characterizes the abilities of the ensemble of processes and resources. It describes what the operation excels at and is naturally linked to the customer value proposition.

## 3. Identify the key decisions and relationships in our framework for operations strategy.

Our framework for operations strategy builds on the principle of alignment: the competencies of the operational system should be aligned with the competitive position that the firm seeks over time. Operations strategy formulation can thus start from the competitive position, ask what operations competencies are needed, and then choose the activity network and resource bundle compatible with those competencies. Instead of this market perspective, the sequence can be reversed using the resource perspective.

The competency view involves decisions on the prioritization of cost, time, quality, and flexibility. The resource strategy involves sizing, timing, and deciding on the appropriate types and locations of resources. The process strategy decides on supply and demand management (the interfaces with inputs and outputs); internal technology (coordination and information, process, product, and transportation); and planning for the future through improvement and innovation management.

## 4. Use three tools to implement the principle of alignment and tailor operations strategy.

Tailoring operations is the tool to achieve strategic fit with the competitive strategy. While the following chapters will investigate how to tailor each driver of an operations strategy, we discussed three qualitative guidelines for tailoring: the strategic operational audit, which is a gap analysis to assess the degree of strategic fit and to inspire improvement actions; the balanced scorecard map, which seeks to integrate the market, operations, and financial views of the organization; and the product-process matrix to verify alignment between process and product attributes.

As a tailored operation, Zara provided an example of the framework and reinforced the key message of this chapter: all eight operations drivers reinforce each other and yield a uniquely tailored operational system whose competencies are aligned with its strategy.

## DISCUSSION QUESTIONS

1. Which of the following are tangible or intangible real assets, and which are financial: a cappuccino maker, a coffee chain's (e.g., Starbucks) recipe and standard procedure to make cafe latte, a lease for a coffee shop, the coffee chain's culture and the provision of health-care benefits to half-time employees, the enterprise resource planning software, and the training program for new employees?
2. Consider several types of operations-related decisions that airlines make and characterize them as either strategic or operational.
3. Contrast the operational systems of a full-service airline (e.g., Lufthansa Airlines) with those of a low-cost airline (e.g., Ryanair). Are their operational systems (describe their processes and resources) tailored to their mission?

4. How would you measure the value that a firm provides to its customers? How do you determine what part of that value the firm captures?
5. What are the main disadvantages of the market view of operations strategy formulation? What are the main disadvantages of the resource view?
6. How would you characterize the view of operations strategy formulation that innovators take? Contrast, for example, the two major biotech companies Amgen and Genentech.

Visit [www.vanmieghem.us](http://www.vanmieghem.us) for additional questions and updates.

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## Mini-Case 1 THE SWISS WATCH INDUSTRY

<sup>9</sup>Swiss watches are legendary. Swiss watches once dominated the world: in the mid 1970s, 43% of the units sold worldwide were Swiss made. Then things changed. By 1983, Swiss market shares plunged to less than 15%, and 1000 of the 1600 Swiss watch companies closed. These massive closures were accompanied by a contraction of the labor market by two thirds.

At the brink of bankruptcy, the creditor banks of the two flagships of the Swiss watch industry, Swiss-French SSIH and Swiss-German ASU AG, asked the consulting firm Hayek Engineering for advice: *Should we shut down or can you design a new operations strategy?*

### The worldwide watch industry

During the late 1970s, manufacturers from Japan and Hong Kong penetrated the watch market by using low-cost labor, quartz technology (developed, but not used in Switzerland) and mass production. Their inexpensive watches quickly gained an important market share. To compensate for the lost revenues from diminished market share, Swiss watchmakers raised prices.

By 1980, the world market for watches was about 500 million units per year and consisted of three segments. The low-end segment had prices up to about \$75 and represented 450 million units out of 500 million. The middle segment with prices up to \$450 represented 42 million units, leaving 8 million watches for the top segment.

Margin retreat left the Swiss with zero share of the low-end segment; only 3% of the middle segment; but 97% share of the luxury watches (which accounted for 0.4% of world unit watch sales).

### Watch technology

Mechanical watches consist of two groups of parts: the visible exterior parts such as the case, the dial, and hands, as well as the interior "movement," which contains about 200 individual parts and is driven merely by a spring. After a long evolution, two main mechanical watch technologies emerged. The *lever* was used for expensive watches where jewels tipped the teeth in the movement. The *pin pallet* was used for cheaper watches.

The process to produce and assemble mechanical watches was labor intensive. Master artists would work in a library-style environment on well-lit work desks with microscopes where they would compile a piece of "living art" worth more than the sum of its parts. In the mid 20th century, most watches sold in jewelry shops for hundreds of dollars. Their full production cost consisted of approximately 60% labor, 20% materials and 20% depreciation.

In 1957, the Hamilton Watch Co of Lancaster, Pennsylvania, produced the world's first electric watch. Its traditional balance-wheel mechanism used a bat-

<sup>9</sup>Professor Van Mieghem prepared this case as the basis for class discussion rather than to illustrate either the effective or ineffective handling of a managerial situation. This case is based on an earlier version written by Professor Yehuda Bassok. Taylor (1993) and BBC (2005) are also acknowledged. No part of this case study may be reproduced without permission; direct all inquiries to permissions@vanmieghem.us

tery instead of a spring as power source. In 1960, the next advance in electric watches came from Bulova, a watch company founded in 1875 in New York City by Joseph Bulova, a 23-year-old immigrant from Bohemia. The Bulova corporation replaced the balance-wheel mechanism with the electronic vibrations of a tuning fork. It raised the beat of the watch from 2.5 beats per minute for a mechanical watch to nearly 2.5 million per second for an electronic watch. The tuning fork was kept vibrating by a battery-powered electronic circuit. The Bulova electronic watch was one of the first consumer products to use a transistor.

### The Japanese watch industry

The electronic watch technology was embraced and enhanced by the Japanese watch industry. Since its inception in 1880, the Japanese watch industry was concentrated in the hands of three competitors: K. Hattori (which marketed the Seiko brand), Citizen and Orient. The three companies accounted for 50%, 30% and 20% of production in 1950, respectively. Japanese manufacturers used skilled labor commanding wages at a level of approximately 1/10 of those in Switzerland.

During the 1950s, Seiko pursued the goal of closing the technological gap between the Swiss products and its own products. They also developed a policy of standardizing the movements of the different watches and invested heavily in automatic equipment. This permitted Seiko to reduce labor to 35% of the full production cost of a watch in the late 1960s. Vertical integration of component manufacturing also permitted more rapid deployment of new technology and watch design. One industry observer estimated that the Japanese enjoyed a 15% to 45% variable cost advantage over the Swiss in the mid 1960s. During the late 1960s they initiated component fabrication and assembly operations abroad. Plants were located in Hong Kong, Singapore and Malaysia. Workers in all three locations earned about one third as much as did Japanese workers. In the early 1970s, Hattori-Seiko entered the American and European markets.

Meanwhile, the Swiss research lab CEH (Centre Electronique Horloger) developed a more accurate oscillator and produced the first wristwatch quartz movement in 1967. In contrast to the Swiss manufacturers who had refined their mechanical technology to catch up with Bulova, Seiko made a commitment to develop and produce both analog and digital Quartz watches. The popularity of quartz watches began to grow around 1976. By 1977, Seiko became the largest watch company in the world.

1. How would you contrast the operations strategy of the traditional Swiss watch company with that of Seiko?
2. What information would you gather and what advice would you give? Would you close shop or recommend a new strategy for the Swiss watch industry? For the latter, use the framework describing your recommended value proposition and required changes in competencies and the operational system.