

Analyzing Resources and Capabilities



Analysts have tended to define assets too narrowly, identifying only those that can be measured, such as plant and equipment. Yet the intangible assets, such as a particular technology, accumulated consumer information, brand name, reputation, and corporate culture, are invaluable to the firm's competitive power. In fact, these invisible assets are often the only real source of competitive edge that can be sustained over time.

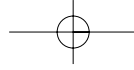
—HIROYUKI ITAMI, MOBILIZING INVISIBLE ASSETS

You've gotta do what you do well.

—LUCINO NOTO, FORMER VICE CHAIRMAN, EXXON MOBIL

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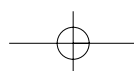
Introduction and Objectives

In Chapter 1, I noted that the focus of strategy thinking has been shifted from the external environment towards its internal environment. In this chapter, we will make the same transition. In looking within the firm, we will concentrate our attention on the resources and capabilities that firms possess. In doing so, we shall build the foundations for our analysis of competitive advantage (which began in Chapter 3 with the discussion of key success factors).

By the time you have completed this chapter you will be able to:

- Appreciate the role of a firm's resources and capabilities as a basis for formulating strategy.
- Identify and appraise the resources and capabilities of a firm.
- Evaluate the potential for a firm's resources and capabilities to confer sustainable competitive advantage.
- Use the results of resource and capability analysis to formulate strategies that exploit internal strengths while defending against internal weaknesses.
- Identify the means through which a firm can develop its resources and capabilities.

We begin by explaining why a company's resources and capabilities are so important to its strategy.



The Role of Resources and Capabilities in Strategy Formulation

Strategy is concerned with matching a firm’s resources and capabilities to the opportunities that arise in the external environment. So far, the emphasis of the book has been the identification of profit opportunities in the external environment of the firm. With this chapter, our emphasis shifts from the interface between strategy and the external environment towards the interface between strategy and the internal environment of the firm – more specifically, with the resources and capabilities of the firm (see Figure 5.1).

Increasing emphasis on the role of resources and capabilities as the basis for strategy is the result of two factors. First, as firms’ industry environments have become more unstable, so internal resources and capabilities rather than external market focus has been viewed as a securer base for formulating strategy. Second, it has become increasingly apparent that competitive advantage rather than industry attractiveness is the primary source of superior profitability. Let us consider each of these factors.

Basing Strategy on Resources and Capabilities

During the 1990s, ideas concerning the role of resources and capabilities as the principal basis for firm strategy and the primary source of profitability coalesced into what has become known as the *resource-based view of the firm*.¹

To understand why the resource-based view has had a major impact on strategy thinking, let us go back to the starting point for strategy formulation: typically some statement of the firm’s identity and purpose (often expressed in a mission statement). Conventionally, firms have answered the question “what is our business?” in terms of the market they serve: “who are our customers?” and “which of their needs are we seeking to serve?” However, in a world where customer preferences are volatile and the identity of customers and the technologies for serving them are changing, a market-focused strategy may not provide the stability and constancy of direction needed to guide strategy over the long term.² When the external environment is in a

FIGURE 5.1 Analyzing resources and capabilities: the interface between strategy and the firm

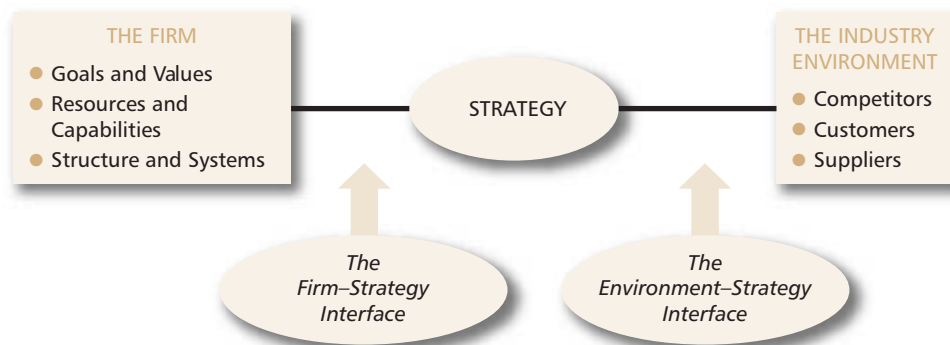
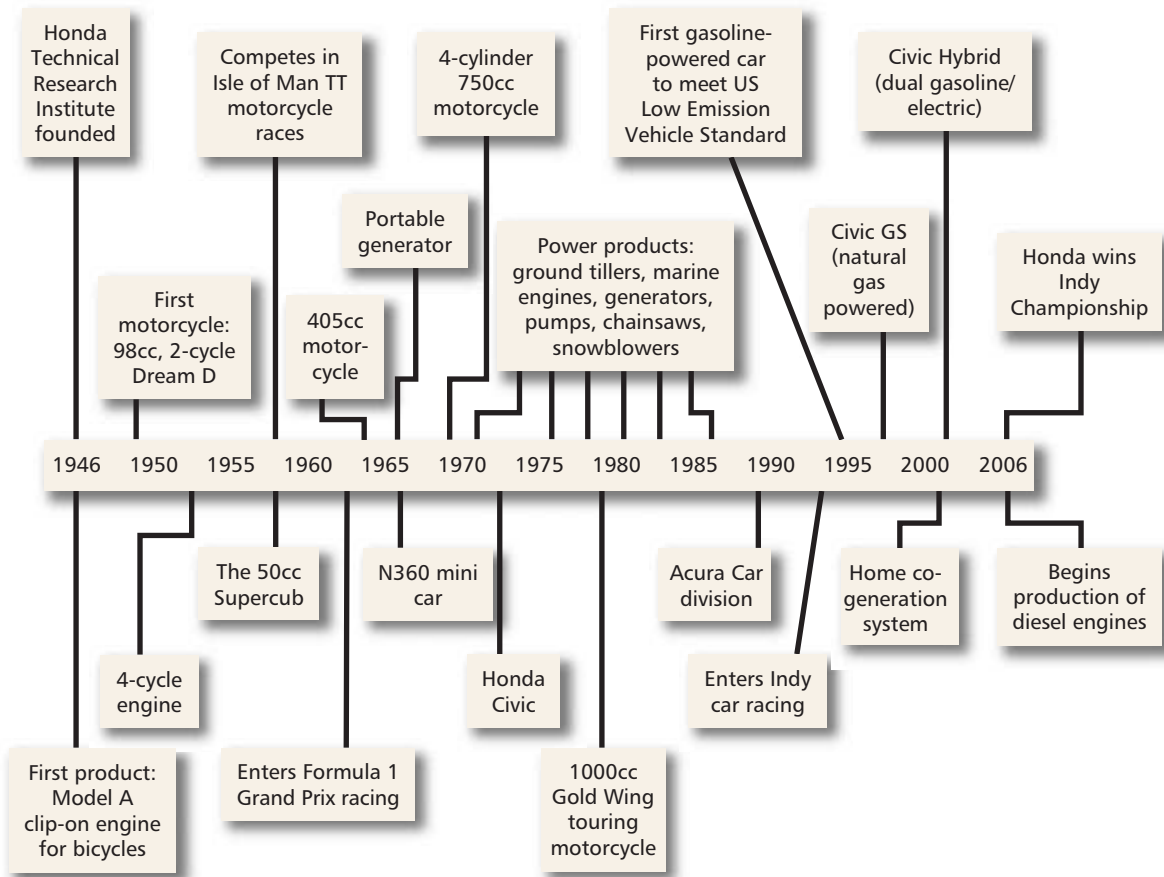


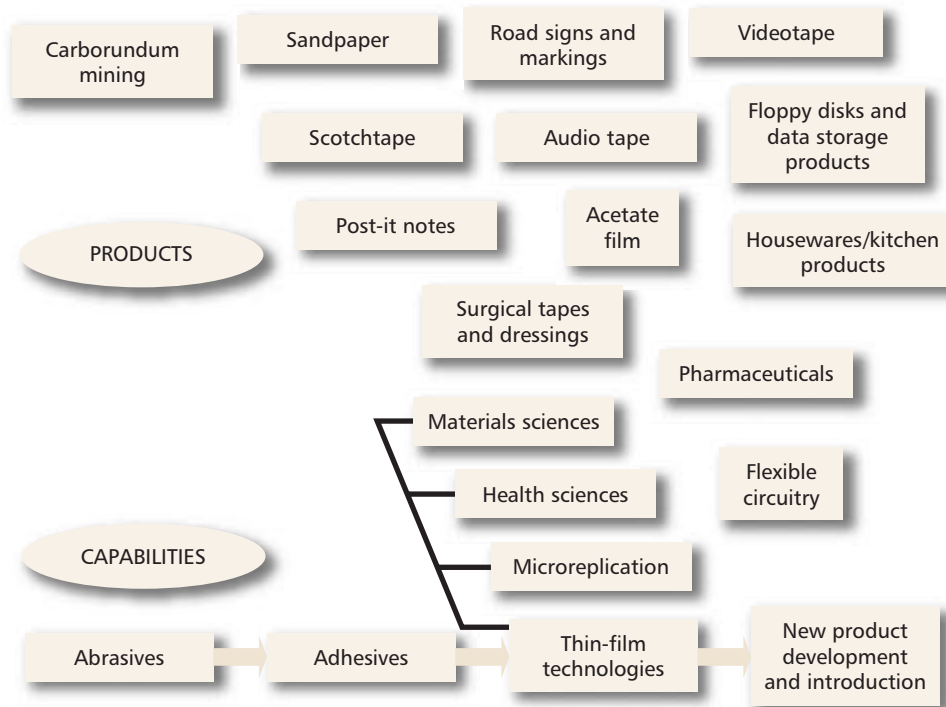
FIGURE 5.2 Honda Motor Company: product development milestones



state of flux, the firm itself, in terms of its bundle of resources and capabilities, may be a much more stable basis on which to define its identity.³

In their 1990 landmark paper, “The Core Competence of the Corporation,” C. K. Prahalad and Gary Hamel painted to the potential for capabilities to be the “roots of competitiveness,” source of new products, and foundation for strategy.⁴ For example:

- Honda Motor Company is the world’s biggest motorcycle producer and a lead supplier of automobiles. But it has never defined itself either as a motorcycle company or a motor vehicle company. Since its founding in 1948, its strategy has been built around its expertise in the development and manufacture of engines; this capability has successfully carried it from motorcycles to a wide range of gasoline-engined products (see Figure 5.2).
- Canon Inc. had its first success producing 35 mm cameras. Since then it has gone on to develop fax machines, calculators, copy machines, printers, video cameras, camcorders, semiconductor manufacturing equipment, and many other products. Almost all Canon’s products involve the application of three areas of technological capability: precision mechanics, microelectronics, and fine optics.

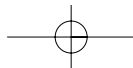
FIGURE 5.3 The evolution of capabilities and products: 3M

- 3M Corporation has expanded from sandpaper, into adhesive tapes, audiotapes and videotapes, road signs, medical products, and floppy disks. Its product list comprises over 30,000 separate products. Is it a conglomerate? Certainly not, claims 3M. Its vast product range rests on a foundation of key technologies relating to adhesives and thin-film coatings, and its remarkable ability to manage the development and marketing of new products (see Figure 5.3).

In general, the greater the rate of change in a firm's external environment, the more likely it is that internal resources and capabilities will provide a secure foundation for long-term strategy. In fast-moving, technology-based industries, new companies are built around specific technological capabilities. The markets where these capabilities are applied are a secondary consideration. Motorola, the Texas-based supplier of wireless telecommunications equipment, semiconductors, and direct satellite communications, has undergone many transformations, from being a leading provider of TVs and car radios to its current focus on telecom equipment. Yet, underlying these transformations has been a consistent focus on wireless electronics.

When a company faces the imminent obsolescence of its core product, should its strategy focus on continuing to serve fundamental customer needs or on deploying its resources and capabilities in other markets?

- When Olivetti, the Italian typewriter manufacturer, faced the displacement of typewriters by microcomputers during the 1980s, it sought to maintain its



focus on serving the word processing needs of businesses by expanding into PCs. The venture was a costly failure.⁵ By contrast, Remington, another leading typewriter manufacturer, moved into products that required similar technical and manufacturing skills: electric shavers and other personal care appliances.⁶

- Eastman Kodak's dominance of the world market for photographic products based on chemical imaging has been threatened by digital imaging. Over the past 25 years, Kodak has invested billions of dollars developing digital technologies and digital imaging products. Yet profits and market leadership in digital imaging remain elusive for Kodak. Might Kodak have been better off sticking with its chemical know-how and developing its interests in specialty chemicals, pharmaceuticals, and healthcare?⁷

The difficulties experienced by established firms in adjusting to technological change within their own markets are well documented – in typesetting and in disk-drive manufacturing, successive technological waves have caused market leaders to falter and allowed new entrants to prosper.⁸

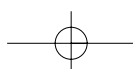
Resources and Capabilities as Sources of Profit

In Chapter 1, we identified two major sources of superior profitability: industry attractiveness and competitive advantage. Of these, competitive advantage is the more important. Internationalization and deregulation have increased competitive pressure within most sectors; as a result, few industries (or segments) offer cozy refuges from vigorous competition. As we observed in the previous chapter (see Table 4.1), industry factors account for only a small proportion of interfirm profit differentials. Hence, establishing competitive advantage through the development and deployment of resources and capabilities, rather than seeking shelter from the storm of competition, has become the primary goal for strategy.

The distinction between industry attractiveness and competitive advantage (based on superior resources) as sources of a firm's profitability corresponds to economists' distinction between different types of profit (or *rent*). The profits arising from market power are referred to as *monopoly rents*; those arising from superior resources are *Ricardian rents*, after the 19th-century British economist David Ricardo. Ricardo showed that, even when the market for wheat was competitive, fertile land would yield high returns. Ricardian rent is the return earned by a scarce resource over and above the cost of bringing it into production.⁹

In practice, distinguishing between profit arising from market power and profit arising from resource superiority is less clear in practice than in principle. A closer look at Porter's five forces framework suggests that industry attractiveness derives ultimately from the ownership of resources. Barriers to entry, for example, are the result of patents, brands, distribution channels, learning, or some other resource possessed by incumbent firms. Similarly, the lack of rivalry resulting from the dominance of a single firm (monopoly) or a few firms (oligopoly) is usually based on the concentrated ownership of key resources such as technology, manufacturing facilities, or distribution facilities.

The resource-based approach has profound implications for companies' strategy formulation. When the primary concern of strategy was industry selection and positioning, companies tended to adopt similar strategies. The resource-based view, by



contrast, emphasizes the uniqueness of each company and suggests that the key to profitability is not through doing the *same* as other firms, but rather through exploiting *differences*. Establishing competitive advantage involves formulating and implementing a strategy that exploits the uniqueness of a firm's portfolio of resources and capabilities.

The remainder of this chapter outlines a resource-based approach to strategy formulation. Fundamental to this approach is recognizing that a firm must seek a thorough and profound understanding of its resources and capabilities. Such understanding provides a basis for:

- 1 Selecting a strategy that exploits an organization's key strengths. Mariah Carey's disastrous 2001–2 was the result of her straying from her core competences (see Strategy Capsule 5.1). Walt Disney's turnaround under Michael Eisner's leadership was the result of exploiting its underlying resources more effectively (see Strategy Capsule 5.2).
- 2 Developing the firm's resources and capabilities. Resource analysis is not just about deploying existing resources, it is also concerned with filling resource gaps and building capability for the future. Toyota, Microsoft, Johnson & Johnson, and British Petroleum are all companies whose long-term success

STRATEGY CAPSULE 5.1

Focusing Strategy around Core Capabilities: Lyor Cohen on Mariah Carey

2001 was a disastrous year for Mariah Carey. Her first movie, *Glitter*, was a flop, the soundtrack was Carey's most poorly received album in a decade, her \$80 million recording contract was dropped by EMI, and she suffered a nervous breakdown.

Lyor Cohen, the aggressive, workaholic chief executive of Island Def Jam records was quick to spot an opportunity:

"I cold-called her on the day of her release from EMI and I said, I think you are an unbelievable artist and you should hold your head up high," says Cohen. "What I said stuck on her and she ended up signing with us."

His strategic analysis of Carey's situation was concise:

"I said to her, what's your competitive advantage? A great voice, of course. And what else? You write every one of your songs – you're a great writer. So why did you stray from your competitive advantage? If you have this magnificent voice and you write such compelling songs, why are you dressing like that, why are you using all these collaborations [with other artists and other songwriters]? Why? It's like driving a Ferrari in first – you won't see what that Ferrari will do until you get into sixth gear."

Cohen signed Carey in May 2002. Under Universal Music's Island Def Jam Records, Carey returned to her core strengths: her versatile voice, song-writing talents, and ballad style. Her new album, *The Emancipation of Mimi*, was the biggest-selling album of 2005, and in 2006 she won a Grammy award.

STRATEGY CAPSULE 5.2

Resource Utilization: Revival at Walt Disney

In 1984, Michael Eisner became CEO of the Walt Disney Company. Between 1984 and 1988, Disney's sales revenue increased from \$1.66 billion to \$3.75 billion, net income from \$98 million to \$570 million, and the stock market's valuation of the company from \$1.8 billion to \$10.3 billion.

The key to the Disney turnaround was the mobilization of Disney's considerable resource base. Prominent among Disney's underutilized resources were 28,000 acres of land in Florida. With the help of the Arvida Corporation, a land development company acquired in 1984, Disney began hotel, resort, and residential development of these landholdings. New attractions were added to the Epcot Center, and a new theme park, the Disney-MGM Studio Tour, was built. Disney World expanded beyond theme parks into resort vacations, the convention business, and residential housing.

To exploit its huge film library, Disney introduced videocassette sales of Disney movies and licensed packages of movies to TV networks. The huge investments in the Disney theme parks were more effectively exploited through heavier marketing effort and increased

admission charges. Encouraged by the success of Tokyo Disneyland, Disney embarked on further international duplication of its US theme parks with Euro Disneyland just outside Paris, France. A chain of Disney Stores was established to push sales of Disney merchandise.

The most ambitious feature of the turnaround was Disney's regeneration as a movie studio. Eisner began a massive expansion of its Touchstone label, which had been established in 1983 with the objectives of putting Disney's film studios to fuller use and establishing the company in the teenage and adult markets. Disney Studios doubled the number of movies in production. In 1988, it became America's leading studio in terms of box office receipts. Studio production was further boosted by Disney's increasing TV presence, both through the Disney Channel and programs for network TV.

Above all, the new management team was exploiting Disney's most powerful and enduring asset: the affection of millions of people of different nations and different generations for the Disney name and the Disney characters.

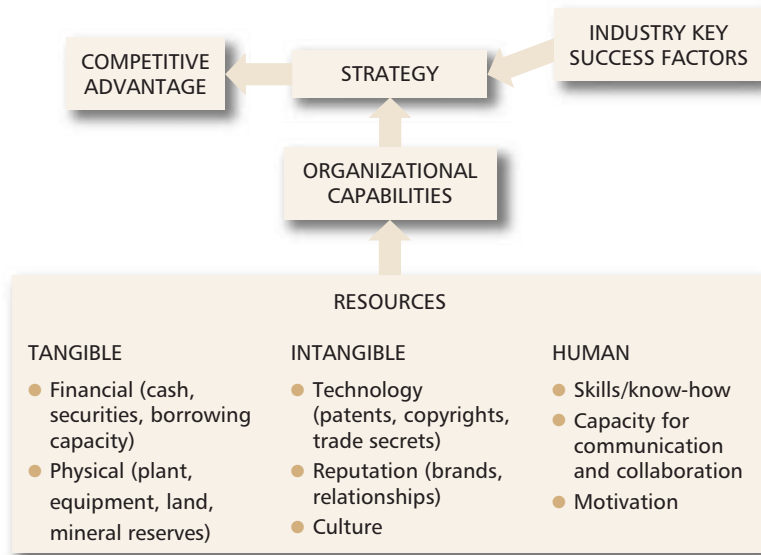
owes much to their commitment to nurturing talent, developing technologies, and building capabilities that allow adaptability to their changing business environments.

Our starting point is to identify and assess the resources and capabilities available to the firm.

The Resources of the Firm

It is important to distinguish between the resources and the capabilities of the firm: resources are the productive assets owned by the firm; capabilities are what the firm

FIGURE 5.4 The links among resources, capabilities, and competitive advantage



can do. Individual resources do not confer competitive advantage, they must work together to create *organizational capability*. It is capability that is the essence of superior performance. Figure 5.4 shows the relationship among resources, capabilities, and competitive advantage.

Drawing up an inventory of a firm’s resources can be surprisingly difficult. No such document exists within the accounting or management information systems of most corporations. The corporate balance sheet provides a limited view of a firm’s resources – it comprises mainly financial and physical resources. To take a wider view of a firm’s resources it is helpful to identify three principal types of resource: tangible, intangible, and human resources.

Tangible Resources

Tangible resources are the easiest to identify and evaluate: financial resources and physical assets are identified and valued in the firm’s financial statements. Yet, balance sheets are renowned for their propensity to obscure strategically relevant information, and to under- or overvalue assets. Historic cost valuation can provide little indication of an asset’s market value. Disney’s movie library had a balance sheet value of \$4.6 billion in 2005, based on production cost less amortization. Its land assets (including its 28,000 acres in Florida) were valued at a paltry \$1.1 billion.

However, the primary goal of resource analysis is not to value a company’s assets, but to understand their potential for creating competitive advantage. Information that British Airways possesses tangible fixed assets with a book value of £8.2 billion is of little use in assessing their strategic value. To assess British Airways’ ability to compete effectively in the world airline industry we need to know about the composition of these assets, the location of land and buildings, the types of plane and their age, and so on.

Once we have fuller information on a company's tangible resources we explore how we can create additional value from them. This requires that we address two key questions:

- 1 *What opportunities exist for economizing on their use?* It may be possible to use fewer resources to support the same level of business, or to use the existing resources to support a larger volume of business. In the case of British Airways, there may be opportunities for consolidating administrative offices and engineering and service facilities. Improved inventory control may allow economies in inventories of parts and fuel. Better control of cash and receivables permits a business to operate with lower levels of cash and liquid financial resources.
- 2 *What are the possibilities for employing existing assets more profitably?* Could British Airways generate better returns on some of its planes by redeploying them into cargo carrying? Should BA seek to redeploy its assets from Europe and the North Atlantic to Asia-Pacific? Might it reduce costs in its European network by reassigning routes to small franchised airlines (such as 93 Airways and Loganair)?

Intangible Resources

For most companies, intangible resources are more valuable than tangible resources. Yet, in company financial statements, intangible resources remain largely invisible – particularly in the US where R&D is expensed. The exclusion or undervaluation of intangible resources is a major reason for the large and growing divergence between companies' balance sheet valuations ("book values") and their stock market valuations (see Table 5.1). Among the most important of these undervalued or unvalued intangible resources are brand names. Table 5.2 shows companies owning brands valued at \$15 billion or more.

Brand names and other trademarks are a form of *reputational asset*: their value is in the confidence they instill in customers. This value is reflected in the price premium that customers are willing to pay for the branded product over that for an unbranded or unknown brand. Brand value (or "brand equity") can be estimated by taking the price premium attributable to a brand, multiplying it by the brand's annual sales volume, then calculating the present value of this revenue stream. The brand valuations in Table 5.2 involve estimating the operating profits for each brand (after taxation and a capital charge), estimating the proportion of net operating income attributable to the brand, then capitalizing these returns. The value of a company's brands can be increased by extending the product/market scope over which the company markets those brands. Philip Morris is an expert at internationalizing its brand franchises. Harley-Davidson's brand strength has not only permitted the company to obtain a price premium of about 40% above that of comparable motorcycles, but also to license its name to the manufacturers of clothing, coffee mugs, cigarettes, and restaurants.

Reputation may be attached to a company as well as to its brands. Companies depend on the support from employees, customers, investors, and governments.¹⁰ Harris Interactive shows Johnson & Johnson followed by Coca-Cola, Google, UPS, and 3M to have the highest "reputation quotients."¹¹

Like reputation, technology is an intangible asset whose value is not evident from most companies' balance sheets. Intellectual property – patents, copyrights, trade

TABLE 5.1 Major companies with the Highest Market-to-Book Ratios, December 2005

Company	Valuation ratio	Country	Company	Valuation ratio	Country
Yahoo!	72.0	Japan	Coca-Cola	7.8	US
Colgate-Palmolive	20.8	US	Diageo	7.4	UK
GlaxoSmithKline	13.4	UK	3M	7.3	US
Anheuser-Busch	12.6	US	Nokia	6.7	Finland
eBay	11.2	US	Sanofi-Aventis	6.3	France
SAP	10.8	Germany	AstraZeneca	5.9	UK
Yahoo!	10.7	US	Johnson & Johnson	5.7	US
Dell Computer	10.0	US	Boeing	5.7	US
Sumitomo Mitsui Financial	8.8	Japan	Eli Lilly	5.6	US
Procter & Gamble	8.4	US	Cisco Systems	5.5	US
Qualcomm	8.3	US	Roche Holding	5.5	Switz.
Schlumberger	8.2	US	L'Oreal	5.3	France
Unilever	8.1	Neth./UK	Altria	5.2	US
PepsiCo	8.0	US	Novartis	5.1	Switz.

Note: The table includes companies with the highest market capitalization as a proportion of balance sheet net asset value among the top 200 companies of the world with the largest market capitalization at the end of 2005.

secrets, and trademarks – comprise technological and artistic resources where ownership is defined in law. Over the past 20 years, companies have become more attentive to the value of their intellectual property. Texas Instruments was one of the first companies to begin managing its patent portfolio in order to maximize its licensing revenues. For some companies, their ownership of intellectual property is a key source of their market value. For example, Qualcomm's patents relating to CDMA digital wireless telephony make it one of the most valuable companies in the telecom sector, while IBM's position as the world's biggest patent holder results in a royalty stream of over \$1.2 billion a year.

Human Resources

The human resources of the firm are the expertise and effort offered by its employees. Human resources do not appear on corporate balance sheets for the simple reason that people are not owned: they offer their services under employment contracts. Identifying and appraising the stock of human resources within a firm is complex and difficult. Human resources are appraised at the time of recruitment and throughout the period of employment, e.g. through annual performance reviews.

Companies are continually seeking more effective methods to assess the performance and potential of their employees. Over the past decade, human resource appraisal has become far more systematic and sophisticated. Organizations are relying less on formal qualifications and years of experience and more on attitude, motivation, learning capacity, and potential for collaboration. *Competency modeling*

TABLE 5.2 The World's Most Valuable Brands, 2006

Rank	Brand	Brand value in 2006, \$ billion	Change from 2004	Country of origin
1	Coca-Cola	67.5	0%	USA
2	Microsoft	59.9	-2%	USA
3	IBM	53.4	-1%	USA
4	GE	47.0	+7%	USA
5	Intel	35.6	+6%	USA
6	Nokia	26.5	+10%	Finland
7	Disney	26.4	-2%	USA
8	McDonald's	26.0	+4%	USA
9	Toyota	24.8	+10%	Japan
10	Marlboro	21.2	-4%	USA
11	Mercedes Benz	20.0	-6%	Germany
12	Citi	20.0	0%	USA
13	Hewlett-Packard	18.9	-10%	USA
14	American Express	18.6	+5%	USA
15	Gillette	17.5	+5%	USA
16	BMW	17.1	+8%	Germany
17	Cisco	16.6	+4%	USA
18	Louis Vuitton	16.1	n.a.	France
19	Honda	15.8	+6%	Japan
20	Samsung	15.0	19%	S. Korea

Note: Brand values are calculated as the net present value of future earnings generated by the brand.

SOURCE: INTERBRAND.

involves identifying the set of skills, content knowledge, attitudes, and values associated with superior performers within a particular job category, then assessing each employee against that profile.¹² The results of such competency assessments can then be used to identify training needs, make selections for hiring or promotion, and determine compensation. A key outcome of systematic assessment has been recognition of the importance of psychological and social aptitudes in linking technical and professional abilities to overall job performance. Recent interest in *emotional intelligence* reflects growing recognition of the importance of social and emotional skills and values.¹³

The ability of employees to harmonize their efforts and integrate their separate skills depends not only on their interpersonal skills but also the organizational context. This organizational context as it affects internal collaboration is determined by a key intangible resource: the *culture* of the organization. The term *organizational culture* is notoriously ill defined. It relates to an organization's values, traditions, and social norms. Building on the observations of Peters and Waterman that "firms with sustained superior financial performance typically are characterized by a strong set of core managerial values that define the ways they conduct business," Jay Barney identifies organizational culture as a firm resource of great strategic importance that is potentially very valuable.¹⁴

Organizational Capabilities

Resources are not productive on their own. A brain surgeon is close to useless without a radiologist, anesthesiologist, nurses, surgical instruments, imaging equipment, and a host of other resources. To perform a task, a team of resources must work together. An *organizational capability* is a “firm’s capacity to deploy resources for a desired end result.”¹⁵ Just as an individual may be capable of playing the violin, ice skating, and speaking Mandarin, so an organization may possess the capabilities needed to manufacture widgets, distribute them throughout Latin America, and hedge the resulting foreign exchange exposure. We use the terms *capability* and *competence* interchangeably.¹⁶

Our primary interest is in those capabilities that can provide a basis for competitive advantage. Selznick used *distinctive competence* to describe those things that an organization does particularly well relative to its competitors.¹⁷ Prahalad and Hamel coined the term *core competences* to distinguish those capabilities fundamental to a firm’s strategy and performance.¹⁸ Core competences, according to Hamel and Prahalad, are those that:

- Make a disproportionate contribution to ultimate customer value, or to the efficiency with which that value is delivered, and
- Provide a basis for entering new markets.¹⁹

Prahalad and Hamel criticize US companies for emphasizing product management over competence management. They compare the strategic development of Sony and RCA in consumer electronics. Both companies were failures in the home video market. RCA introduced its videodisk system, Sony its Betamax videotape system. For RCA, the failure of its first product marked the end of its venture into home video systems and heralded a progressive retreat from the consumer electronics industry. RCA was acquired by GE, which then sold off the combined consumer electronics division to Thomson of France. Sony, on the other hand, acknowledged the failure of Betamax, but continued to develop its capabilities in video technology. This continuous development and upgrading of its video capabilities resulted in a string of successful video products from camcorders and digital cameras to the PlayStation game console.

Classifying Capabilities

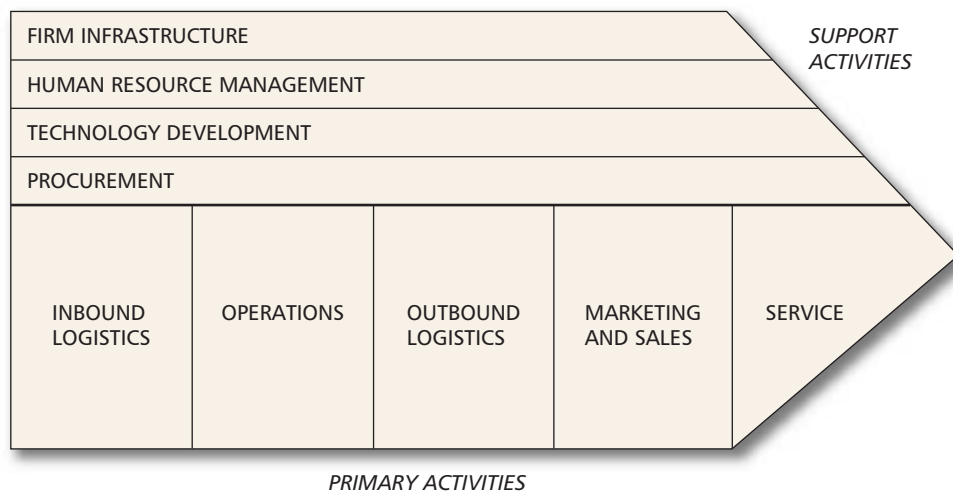
To identify a firm’s capabilities, we need to have some basis for classifying and disaggregating its activities. Two approaches are commonly used:

- 1 A *functional analysis* identifies organizational capabilities in relation to each of the principal functional areas of the firm. Table 5.3 classifies the principal functions of the firm and identifies organizational capabilities pertaining to each function.
- 2 A *value chain analysis* separates the activities of the firm into a sequential chain. Michael Porter’s representation of the value chain distinguishes between *primary activities* (those involved with the transformation of inputs and interface with the customer) and *support activities* (see Figure 5.5). Porter’s generic value chain identifies a few broadly defined activities that can be disaggregated to provide a more detailed identification of the firm’s

TABLE 5.3 A Functional Classification of Organizational Capabilities

Functional area	Capability	Exemplars
CORPORATE FUNCTIONS	● Financial control	Exxon Mobil, PepsiCo
	● Strategic management of multiple businesses	General Electric, Procter & Gamble
	● Strategic innovation	BP, Google
	● Multidivisional coordination	Unilever, Shell
	● Acquisition management	Cisco, Bank of America
	● International management	Shell, Citigroup
MANAGEMENT INFORMATION	● Comprehensive, integrated MIS network linked to managerial decision making	Wal-Mart, Capital One, Dell Computer
RESEARCH & DEVELOPMENT	● Research	IBM, Merck
	● Innovative new product development	3M, Apple
	● Fast-cycle new product development	Canon, Inditex (Zara)
OPERATIONS	● Efficiency in volume manufacturing	Briggs & Stratton, YKK
	● Continuous improvements in operations	Toyota, Harley-Davidson
	● Flexibility and speed of response	Four Seasons Hotels
PRODUCT DESIGN	● Design capability	Nokia, Apple Computer
MARKETING	● Brand management	P&G, Altria
	● Promoting reputation for quality	Johnson & Johnson
	● Responsiveness to market trends	MTV, L’Oreal
SALES AND DISTRIBUTION	● Effective sales promotion and execution	PepsiCo, Pfizer
	● Efficiency and speed of order processing	L. L. Bean, Dell Computer
	● Speed of distribution	Amazon.com
	● Quality and effectiveness of customer service	Singapore Airlines, Caterpillar

FIGURE 5.5 Porter’s value chain



activities (and the capabilities that correspond to each activity). Thus, marketing might include market research, test marketing, advertising, promotion, pricing, and dealer relations.²⁰

The Architecture of Capability

Why is 3M so good at developing new products for a variety of home, office, and medical needs? How is Wal-Mart able to combine relentless cost focus and high levels of flexibility and adaptability? Why is Toyota so superior to either Ford or GM in developing new models of car and launching them globally? We can guess, but the fact remains: we don't really know how organizational capabilities are created or why one company performs a capability more effectively than another. To begin to understand organizational capabilities, let us look at their structure.

Capability as Routine Organizational capability requires the expertise of various individuals to be integrated with capital equipment, technology, and other resources. But how does this integration occur? Virtually all productive activities involve teams of people undertaking closely coordinated actions – typically without detailed direction. Richard Nelson and Sidney Winter have used the term *organizational routines* to refer to these regular and predictable patterns of activity made up of a sequence of coordinated actions by individuals.²¹ Such routines form the basis of most organizational capabilities. At the manufacturing level, a series of routines governs the passage of raw materials and components through the production process to the factory gate. Sales, ordering, distribution, and customer service activities are similarly organized through a number of standardized, complementary routines. Even top management functions comprise routines for monitoring business unit performance, capital budgeting, and strategic planning.

Like individual skills, organizational routines develop through learning-by-doing. Just as individual skills become rusty when not exercised, so it is difficult for organizations to retain coordinated responses to contingencies that arise only rarely. Hence, there may be a tradeoff between efficiency and flexibility. A limited repertoire of routines can be performed highly efficiently with near-perfect coordination. The same organization may find it extremely difficult to respond to novel situations.²²

Routinization is an essential step in translating directions and operating practices into capabilities. In every McDonald's hamburger restaurant, operating manuals provide precise directions for the conduct of every activity undertaken, from the placing of the pickle on the burger to the maintenance of the milk-shake machine. In practice, the operating manuals are seldom referred to in the course of day-to-day operations – through continuous repetition, tasks become routinized.

The Hierarchy of Capabilities Whether we examine capabilities from a functional or value chain approach, it is evident that broad functions or value chain activities can be disaggregated into more specialist capabilities performed by smaller teams of resources. What we observe is a hierarchy of capabilities where more general, broadly defined capabilities are formed from the integration of more specialized capabilities. For example:

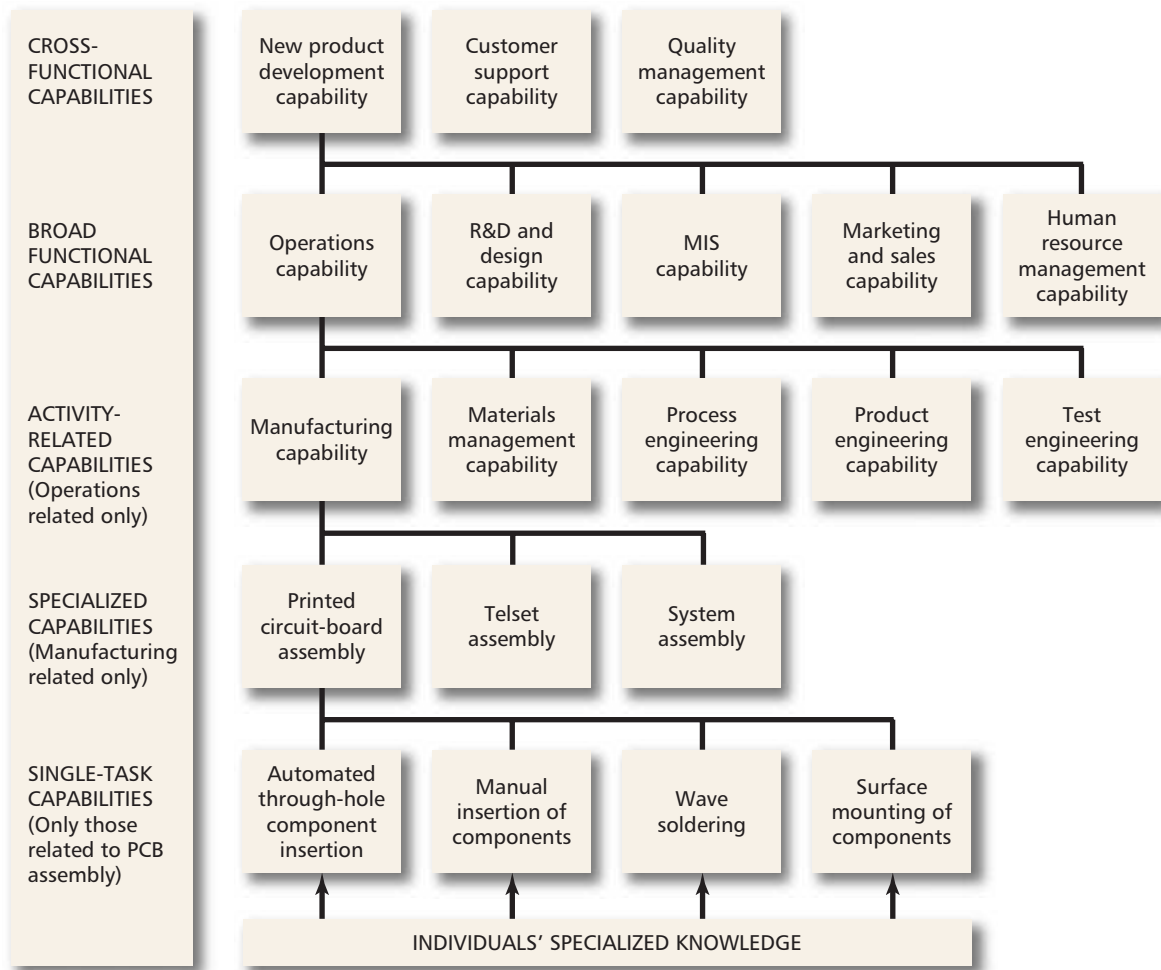
- A hospital's capability in treating heart disease depends on its integration of capabilities pertaining to a patient's diagnosis, physical medicine,

cardiovascular surgery, pre- and post-operative care, as well as capabilities relating to various administrative and support functions.

- Toyota’s manufacturing capability – its system of “lean production” – integrates capabilities relating to the manufacture of components and subassemblies, supply-chain management, production scheduling, assembly, quality control procedures, systems for managing innovation and continuous improvement, and inventory control.

Figure 5.6 offers a partial view of the hierarchy of capabilities of a telecom equipment maker. At the highest level of integration are those capabilities which integrate across multiple functions. New product development draws upon a broad range of functional capabilities – which is why it is so difficult to manage. One solution to the problems of integrating functional know-how into new product development is the creation of cross-functional product development teams. The use of such product development teams (led by a “heavyweight” team leader) by Toyota, Nissan, and

FIGURE 5.6 The hierarchical nature of capabilities: a manufacturer of PBXs



Honda has been a key reason for these firms' fast-cycle new product development compared with US and European car companies.²³

Appraising Resources and Capabilities

So far, we have established what resources and capabilities are, how they can provide a long-term focus for a company's strategy, and how we can go about identifying them. However, if the focus of this book is the pursuit of profit, we also need to appraise the potential for resources and capabilities to earn profits for the company.

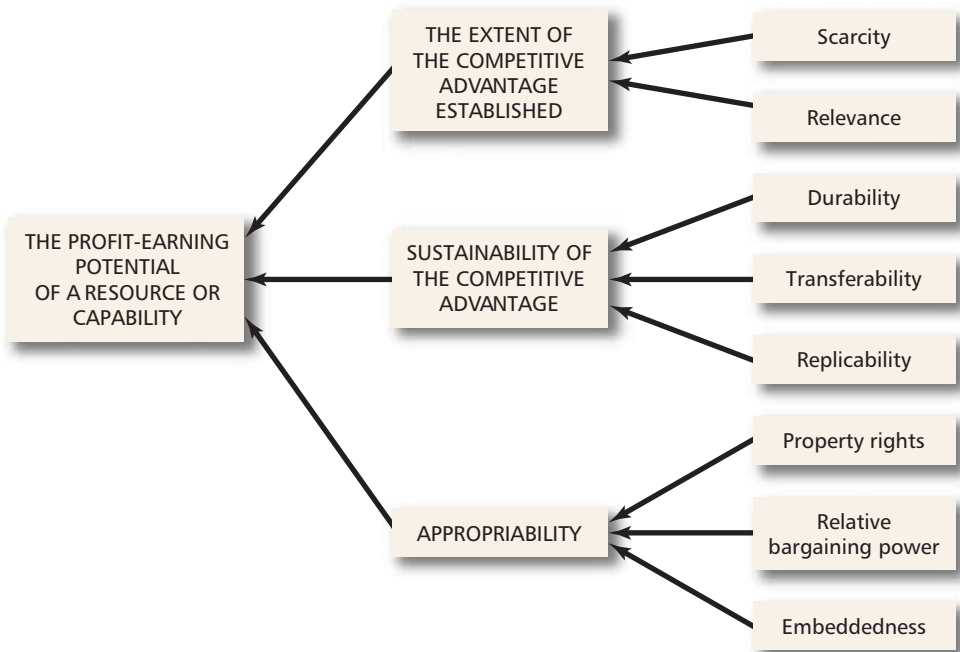
The profits that a firm obtains from its resources and capabilities depend on three factors: their abilities to *establish* a competitive advantage, to *sustain* that competitive advantage, and to *appropriate* the returns to that competitive advantage. Each of these depends on a number of resource characteristics. Figure 5.7 shows the key relationships.

Establishing Competitive Advantage

For a resource or capability to establish a competitive advantage, two conditions must be present:

- 1 *Scarcity*. If a resource or capability is widely available within the industry, then it may be essential to compete, but it will not be a sufficient basis for competitive advantage. In oil and gas exploration, new technologies such as directional drilling and 3-D seismic analysis are critical to reducing the costs

FIGURE 5.7 Appraising the strategic importance of resources and capabilities



of finding new reserves. However, these technologies are widely available from oilfield service and IT companies. As a result, such technologies are “needed to play,” but they are not sufficient to win.

- 2 **Relevance.** A resource or capability must be relevant to the key success factors in the market. British coal mines produced some wonderful brass bands. Unfortunately, musical capabilities did little to assist the mines in meeting competition from cheap imported coal and North Sea gas. As retail banking shifts toward automated teller machines and online transactions, so the retail branch networks of the banks have become less relevant for customer service.

Sustaining Competitive Advantage

The profits earned from resources and capabilities depend not just on their ability to *establish* competitive advantage, but also on how long that advantage can be *sustained*. This depends on whether resources and capabilities are *durable* and whether rivals can *imitate* the competitive advantage they offer. Resources and capabilities are imitable if they are *transferable* or *replicable*.

Durability Some resources are more durable than others and, hence, are a more secure basis for competitive advantage. The increasing pace of technological change is shortening the useful life span of most resources including capital equipment and proprietary technologies. Brands, on the other hand, can show remarkable resilience to time. Heinz sauces, Kellogg’s cereals, Campbell’s soup, Hoover vacuum cleaners, and Coca-Cola have been market leaders for over a century.

Transferability The simplest means of acquiring the resources and capabilities necessary for imitating another firm’s strategy is to buy them. The ability to buy a resource or capability depends on its *transferability* – the extent to which it is mobile between companies. Some resources, such as finance, raw materials, components, machines produced by equipment suppliers, and employees with standardized skills (such as short-order cooks and auditors), are transferable and can be bought and sold with little difficulty. Some resources are not easily transferred – either they are entirely firm specific, or their value depreciates on transfer.²⁴

Sources of immobility include:

- Geographical immobility of natural resources, large items of capital equipment, and some types of employees may make it difficult for firms to acquire these resources without relocating themselves.
- Imperfect information regarding the quality and productivity of resources creates risks for buyers. Such imperfections are especially important in relation to human resources – hiring decisions are typically based on very little knowledge of how the new employee will perform. Sellers of resources have better information about the characteristics of the resources on offer than potential buyers – this creates a “lemons problem” for firms seeking to acquire resources.²⁵ Jay Barney has shown that different valuations of resources by firms can result in their being either underpriced or overpriced, giving rise to differences in profitability between firms.²⁶
- Complementarity between resources means that the detachment of a resource from its “home team” causes it to lose productivity and value. Thus, if brand

reputation is associated with the company that created it, a change in ownership of the brand erodes its value. The transfer of the *Thinkpad* brand of notebook computers from IBM to Lenovo almost certainly eroded its value.²⁷

- Organizational capabilities, because they are based on teams of resources, are less mobile than individual resources. Even if the whole team can be transferred (in investment banking it has been commonplace for whole teams of analysts or M&A specialists to defect from one bank to another), the dependence of the team on a wider network of relationships and corporate culture may pose difficulties for recreating the capability in the new company.

Replicability If a firm cannot buy a resource or capability, it must build it. In financial services, most innovations in new derivative products can be imitated easily by competitors. In retailing too, competitive advantages that derive from store layout, point-of-sale technology, charge cards, and extended opening hours can also be copied easily by competitors.

Less easily replicable are capabilities based on complex organizational routines. Federal Express's national, next-day delivery service and Nucor's system for steel manufacturing that combines efficiency with flexibility are complex capabilities based on unique corporate cultures. Some capabilities appear simple but prove difficult to replicate. Just-in-time scheduling and quality circles are relatively simple techniques used effectively by Japanese companies. Although neither require advanced manufacturing technologies or sophisticated information systems, their dependence on high levels of collaboration through communication and trust meant that many American and European firms had difficulty implementing them.

Even where replication is possible, incumbent firms may benefit from the fact that resources and capabilities that have been accumulated over a long period can only be replicated at disproportionate cost by would-be imitators. Dierickx and Cool identify two major sources of incumbency advantage:

- *Asset mass efficiencies* occur where a strong initial position in technology, distribution channels, or reputation facilitates the subsequent accumulation of these resources.
- *Time compression diseconomies* are the additional costs incurred by imitators when attempting to accumulate rapidly a resource or capability. Thus, "crash programs" of R&D and "blitz" advertising campaigns tend to be less productive than similar expenditures made over a longer period.²⁸

Appropriating the Returns to Competitive Advantage

Who gains the returns generated by superior capabilities? We should normally expect that such returns accrue to the owner of that capability. However, ownership is not always clear-cut: capabilities depend heavily on the skills and efforts of employees – who are not owned by the firm. For companies dependent on human ingenuity and know-how, the mobility of key employees represents a constant threat to their competitive advantage (see Strategy Capsule 5.3). In investment banks and other human capital-intensive firms, the struggle between employees and shareholders to appropriate rents is reminiscent of the war for surplus value between labor and capital that

STRATEGY CAPSULE 5.3**When Your Competitive Advantage Walks Out the Door: Gucci**

On September 10, 2001, French retailer Pinault Printemps Redoute (PPR) agreed to acquire Gucci Group – the Italian-based fashion house and luxury goods maker. On November 4, 2003 the managers and shareholders of the two companies were stunned to learn that Chairman Domenico De Sole and Vice Chairman Tom Ford would be leaving Gucci in April 2004.

The duo had masterminded Gucci's transformation from a chaotic, near-bankrupt family firm with an over-licensed brand into a close rival to LVMH – the luxury goods powerhouse. As creative director, Tom Ford had established Gucci as the hottest label around, through fashion shows that were practically rock shows, associations with famous faces, and hiring young designers such as Stella McCartney and Alexander McQueen. De Sole's astute leadership had instituted careful planning and financial discipline, and built Gucci's global presence (especially in Asia).

How great a blow was De Sole and Ford's departure to the parent PPR? In principle, a new CEO and new head of design could be hired. In practice, talent of the ilk of De Sole and Ford was a rare commodity. Especially rare was the combination of a designer and a CEO who could work together with the harmony and shared vision of De Sole and Ford.

The stock market's reaction was ominous. On November 3, 2003 Gucci's share price was \$86.10; on November 6 it had fallen to \$84.60, however, in the absence of PPR's guarantee to acquire their shares at \$85.52, analysts estimated that Gucci would be trading at around \$74. The implication is that Gucci was worth \$1.2 billion less without De Sole and Ford than with them.

Source: Adapted from articles in the *Financial Times* during November 5–8, 2003.

Marx analyzed. It is notable that in 2005, average employee pay among Goldman Sachs' 24,000 staff (including secretaries and janitors) was \$520,000.²⁹ The prevalence of partnerships (rather than joint-stock companies) in professional service industries (lawyers, accountants, and management consultants) reflects the desire to avoid conflict between owners and its human resources.

The less clearly defined are property rights in resources and capabilities, the greater the importance of relative bargaining power in determining the division of returns between the firm and its individual members. In the case of team-based organizational capabilities, this balance of power between the firm and an individual employee depends crucially on the relationship between individuals' skills and organizational routines. The more deeply embedded are individual skills and knowledge within organizational routines, and the more they depend on corporate systems and reputation, the weaker the employee is relative to the firm.

Conversely, the closer an organizational capability is identified with the expertise of individual employees, and the more effective those employees are at deploying their bargaining power, the better able employees are to appropriate rents. If the

individual employee's contribution to productivity is clearly identifiable, if the employee is mobile, and if the employee's skills offer similar productivity to other firms, the employee is in a strong position to appropriate most of his or her contribution to the firm's value added. Does the \$27.7 million paid to Shaquille O'Neal fully exploit his value to the Miami Heat? In most professional sports, it appears that strategies based exclusively on signing superstar players result in the players appropriating most of the rents, with little surplus available for the clubs – this was certainly the fate of Real Madrid during 2002–6.³⁰ In recent years investment banks and consulting companies have emphasized the team-based nature of their capabilities. In downplaying the role of individual expertise, they can improve their firm's potential for appropriating the returns to their capabilities.

Putting Resource and Capability Analysis to Work: A Practical Guide

We have covered the principal concepts and frameworks for analyzing resources and capabilities. How do we put this analysis into practice? Let me offer a simple, step-by-step approach to how a company can appraise its resources and capabilities and then use the appraisal to guide strategy formulation.

Step 1 Identify the Key Resources and Capabilities

To draw up a list of the firm's resources and capabilities, we can begin from outside or inside the firm. From an external focus, we begin with key success factors (see Chapter 3). What factors determine why some firms in an industry are more successful than others and on what resources and capabilities are these success factors based? Suppose we are evaluating the resources and capabilities of Volkswagen AG, the German-based automobile manufacturer. We can start with key success factors in the world automobile industry: low-cost production, attractively designed new models embodying the latest technologies, and the financial strength to weather the cyclical-ity and heavy investment requirements of the industry. What capabilities and resources do these key success factors imply? They would include manufacturing capabilities, new product development capability, effective supply chain management, global distribution, brand strength, scale-efficient plants with up-to-date capital equipment, a strong balance sheet, and so on. To organize and categorize these various resources and capabilities, it is helpful to switch to the inside of VW and look at the company's value chain, identifying the sequence of activities from new product development to purchasing, to supply chain management, to component manufacture, assembly, and right the way through to dealership support and after-sales service. We can then look at the resources that underpin the capabilities at each stage of the value chain. Table 5.4 lists VW's principal resources and capabilities.

Step 2 Appraising Resources and Capabilities

Resources and capabilities need to be appraised against two key criteria. First is their *importance*: which resources and capabilities are most important in conferring sustainable competitive advantage? Second, where are our strengths and weaknesses as compared with competitors?

Assessing Importance The temptation in assessing which resources and capabilities are most important is to concentrate on customer choice criteria. What we must bear in mind, however, is that our ultimate objective is not to attract customers, but to make superior profit through establishing a sustainable competitive advantage. For this purpose we need to look beyond customer choice to the underlying strategic characteristics of resources and capabilities. To do this we need to look at the set of appraisal criteria outlined in the previous section on “Appraising Resources and Capabilities.” In the case of VW, many resources and capabilities are essential to compete in the business, but several of them are not scarce (for example, total quality management capability and technologically advanced assembly plants have become widely diffused within the industry), while others (such as IT capability and design capability) are outsourced to external providers – either way, they are “needed to play” but not “needed to win.” On the other hand, resources such as brand strength and a global distribution network, and capabilities such as fast-cycle new product development and global logistics capability, cannot be easily acquired or internally developed – they are critical to establishing and sustaining advantage.

Assessing Relative Strengths Objectively appraising the comparative strengths and weaknesses of a company’s resources and capabilities relative to competitors is difficult. In assessing their own competencies, organizations frequently fall victim to past glories, hopes for the future, and their own wishful thinking. The tendency toward hubris among companies – and their senior managers – means that business success often sows the seeds of its own destruction.³¹ Among the failed industrial companies in America and Europe are many whose former success blinded them to their stagnating capabilities and declining competitiveness: examples include the cutlery producers of Sheffield, England and the integrated steel giants of the United States.

To identify and appraise a company’s capabilities, managers must look both inside and outside. Internal discussion can be valuable in sharing insights and evidence and building consensus regarding the organization’s resource and capability profile. The evidence of history can be particularly revealing in reviewing instances where the company has performed well and those where it has performed poorly: do any patterns appear?

Finally, to move the analysis from the subjective to the objective level, *benchmarking* is a powerful tool for quantitative assessment of performance relative to that of competitors. Benchmarking is “the process of identifying, understanding, and adapting outstanding practices from organizations anywhere in the world to help your organization improve its performance.”³² Benchmarking offers a systematic framework and methodology for identifying particular functions and processes and then for comparing their performance with other companies. Strategy Capsule 5.4 offers some examples. As McKinsey & Co. has shown, performance difference between top-performing and average-performing companies in most activities tends to be wide.³³

Ultimately, appraising resources and capabilities is not about data, it’s about insight and understanding. Every organization has some activity where it excels or has the potential to excel. For Federal Express, it is a system that guarantees next-day delivery anywhere within the United States. For BMW it is the ability to integrate world-class engineering with design excellence and highly effective marketing. For McDonald’s, it is the ability to supply millions of hamburgers from thousands of outlets throughout the world, with remarkable uniformity of quality, customer service, and hygiene. For General Electric, it is a system of corporate management that

STRATEGY CAPSULE 5.4

Using Benchmarking to Assess Capabilities

Benchmarking allows companies, first, to make objective assessments of their capabilities relative to competitors and, second, to put into place programs to imitate other companies' superior capabilities. For example:

- Xerox Corporation is the pioneer of benchmarking. Losing market share during the 1980s, logistics engineer Robert Camp performed detailed comparisons that showed the massive superiority of Japanese competitors in cost efficiency, quality, and new product development over American companies. Looking beyond direct competitors, every department was encouraged to look globally to identify best-in-class companies against which to benchmark. For inventory control and customer responsiveness, Xerox benchmarked L. L. Bean, the direct-mail clothing company.
- During the early 1980s, a benchmarking study by General Motors discovered that Toyota could make a changeover from one model to another on an automobile assembly line in eight minutes. The comparable time at GM plants was eight hours. The result was profound inquiry within GM as to the appropriateness of its manufacturing strategy and the state of its operational capabilities.

- At Bank of America, Vice Chairman, Martin Sheen, commented, "We have worked a lot with the Royal Bank of Canada on benchmarking because our sizes and philosophies are comparable and we're not direct competitors. We have had some particularly good exchanges with them on processes. We can also benchmark through the Research Board against an array of competitors reported in a disguised fashion. What these do is to highlight anomalies. You can't get down to a unit cost or systems task level. But if a comparable company has 22 people and we have 60, we can sit down and try to figure out what's going on."

The key stages in the benchmarking process are: first, deciding what to benchmark; second, identifying partners; third, establishing benchmarking metrics; fourth, gathering data; and fifth, analysis.

Sources: Robert C. Camp, *Benchmarking: The Search for Industry Best Practices that Lead to Superior Performance* (Milwaukee: Quality Press, 1989); American Productivity & Quality Center, *The Benchmarking Management Guide* (Cambridge, MA: Productivity Press, 1993); R. S. Kaplan, "Limits to Benchmarking," *Balanced Scorecard Report*, November–December, 2005.

reconciles coordination, innovation, flexibility, and financial discipline in one of the world's largest and most diversified corporations. All these companies are examples of highly successful enterprises. One reason why they are successful is that they have recognized what they can do well and have based their strategies on their strengths. For poor-performing companies, the problem is not necessarily an absence of distinctive capabilities, but a failure to recognize what they are and to deploy them effectively.

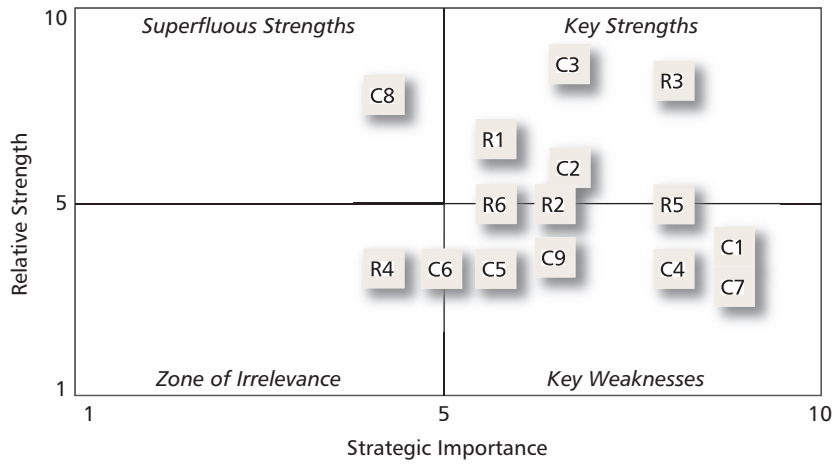
TABLE 5.4 Appraising VW's Resources and Capabilities

	Importance ¹	VW's relative strength ²	Comments
RESOURCES			
R1. Finance	6	6	A– credit rating is above average for the industry, but free cash flow remains negative
R2. Technology	7	5	Despite technical strengths, VW is not a leader in automotive technology
R3. Plant and equipment	8	8	Has invested heavily in upgrading plants
R4. Location	4	4	Plants in key low-cost, growth markets (China, Mexico, Brazil), but German manufacturing base is very high cost
R5. Distribution (dealership network)	8	5	Geographically extensive distribution with special strength in emerging markets. Historically weak position within the US
R6. Brands	6	5	VW, Audi, Bentley, and Bugatti brands are strong – but added to Skoda and Seat too, VW's brands lack clear marker focus
CAPABILITIES			
C1. Product development	9	4	Traditionally weak at VW, with few big hits: Beetle (introduced 1938), Golf (1974), Passat (1974), Vanagon (1979). Despite major upgrading, product development still weak compared to industry leaders
C2. Purchasing	7	5	Traditionally weak – strengthened by senior hires from Opel and elsewhere
C3. Engineering	7	9	The core technical strength of VW
C4. Manufacturing	8	4	VW is a high-cost producer with below average quality
C5. Financial management	6	4	Has traditionally lacked a strong financial orientation
C6. R&D	5	4	Despite several technical strengths, VW is not a leader in automotive innovation
C7. Marketing and sales	9	4	Despite traditional weakness in recognizing and meeting customer needs in different national markets, VW has increased its sensitivity to the market, improved brand management, and managed its advertising and promotion with increasing dexterity
C8. Government relations	4	8	Important in emerging markets
C9. Strategic management	7	4	Effective restructuring and cost cutting, but lack of consistency and consensus at top management level

1 Both scales range from 1 to 10 (1 = very low, 10 = very high).

2 VW's resources and capabilities are compared against those of GM, Ford, Toyota, DaimlerChrysler, Nissan, Honda, Fiat, and PSA, where 5 represents parity. The ratings are based on the author's subjective judgment.

FIGURE 5.8 Appraising VW’s resources and capabilities (hypothetical)



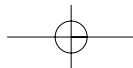
Note: The table is based on the ratings of resources and capabilities in Table 5.4.

Bringing Together Importance and Relative Strength Putting together the two criteria – importance and relative strength – allows us to highlight a company’s key strengths and key weaknesses. Consider, for example, Volkswagen AG. Table 5.4 provides a partial (and hypothetical) identification and appraisal of VW’s resources and capabilities during the late 1990s in relation to the two criteria of importance and relative strength outlined above. Figure 5.8 then brings the two criteria together into a single display. Dividing this display into four quadrants allows us to identify those resources and capabilities that we may regard as key strengths and those that we may identify as key weaknesses. For example, our assessment suggests that plant and equipment, engineering capability, and supply chain management are key strengths of VW, while distribution (a relatively weak presence in the US and Japan), new product development (no consistent record of fast-cycle development of market-winning new models), and financial management are key weaknesses.

Step 3 Developing Strategy Implications

Our key focus is on the two right-hand quadrants of Figure 5.8. How do we exploit our key strengths most effectively? What do we do about our key weaknesses in terms of both upgrading them and reducing our vulnerability to them? Finally, what about our “inconsequential” strengths? Are these really superfluous, or are there ways in which we can deploy them to greater effect?

Exploiting Key Strengths Having identified resources and capabilities that are important and where our company is strong relative to competitors, the key task is to formulate our strategy to ensure that these resources are deployed to the greatest effect. If engineering is a key strength of VW, then it may wish to seek differentiation advantage through technical sophistication and safety features. If VW is effective in managing government relations and is well positioned in the potential growth



markets of China, Eastern Europe, and Latin America, exploiting this strength may require developing models that will appeal to these markets.

To the extent that different companies within an industry have different capability profiles, this implies differentiation of strategies within the industry. Thus, Toyota's outstanding manufacturing capabilities and fast-cycle new product development, Hyundai's low-cost manufacturing capability that derives from its South Korean location, and Peugeot's design flair suggest that each company should be pursuing a distinctively different strategy.

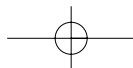
Managing Key Weaknesses What does a company do about its key weaknesses? It is tempting to think of how companies can upgrade existing resources and capabilities to correct such weaknesses. However, converting weakness into strength is likely to be a long-term task for most companies. In the short to medium term, a company is likely to be stuck with the resources and capabilities that it inherits from the previous period.

The most decisive – and often most successful – solution to weaknesses in key functions is to outsource. Thus, in the automobile industry, companies have become increasingly selective in the activities they perform internally. During the 1930s, Ford was almost completely vertically integrated. At its massive River Rouge plant, coal and iron ore entered at one end, completed cars exited at the other. By 2003, Ford had outsourced most component manufacture, much of its design work was being undertaken by independent design studios, and services ranging from IT to security were being provided by third parties. In athletic shoes and clothing, Nike undertakes product design, marketing, and overall “systems integration,” but manufacturing, logistics, and many other functions are contracted out. We shall consider the vertical scope of the firm at greater depth in Chapter 13.

Through clever strategy formulation a firm may be able to negate the impact of its key weaknesses. Consider Harley-Davidson: in competition with Honda, Yamaha, and BMW, and with sales of 300,000 bikes a year (compared with 4 million at Honda), Harley is unable to compete on technology. How has it dealt with this problem? It has made a virtue out of its outmoded technology and traditional designs. Harley-Davidson's obsolete push-rod engines and recycled designs have become central to the retro-look appeal of the “hog.”

What about Superfluous Strengths? What about those resources and capabilities where a company has particular strengths, but these don't appear to be important sources of sustainable competitive advantage? One response may be to lower the level of investment from these resources and capabilities. If a retail bank has a strong, but increasingly underutilized, branch network, this may be an opportunity to prune its real estate assets and invest in IT approaches to customer services.

However, in the same way that companies can turn apparent weaknesses into competitive strengths, so it is possible to develop innovative strategies that turn apparently inconsequential strengths into valuable resources and capabilities. Edward Jones' network of brokerage offices and 8,000-strong sales force looked increasingly irrelevant in an era when brokerage transactions were increasingly going on-line. However, by emphasizing personal service, the trustworthiness of its brokers, and its traditional, conservative investment virtues, Edward Jones has continued to build market share.³⁴



Consider too my own institution, Georgetown University's McDonough School of Business. A unique characteristic of the school is its Jesuit heritage, at first glance an unlikely source of competitive advantage in the fiercely competitive MBA market. Yet, to the extent that a fundamental principle of Jesuit education is developing the whole person and that success as a manager is not just about what you know but also about who you are, Georgetown's Jesuit tradition can provide a key differentiating factor through the MBA program's emphasis on developing the values, integrity, and emotional intelligence necessary to be a successful business leader.

Developing Resources and Capabilities

Conventional approaches to developing resources and capabilities have emphasized *gap analysis* – identifying discrepancies between the current position and the desired future position, then adopting policies to fill those gaps. Such approaches are of limited value. In the case of resources, investing in areas of weakness – whether it is proprietary technology or manufacturing facilities – can be very expensive and, because of the complex complementarities between different resources, such investments may deliver limited returns. In the case of capabilities, because we know little about their structure or operation, developing them is a hazardous endeavor.

The Relationship between Resources and Capabilities

Possibly the most difficult problem in developing capabilities is that we know little about the linkage between resources and capabilities. In most sports, the relationship between the skills of the individual players and team performance is weak. In European football (soccer), teams built with modest expenditures (Bayern Munich, PSV Eindhoven, and Valencia) often outplay star-studded, big-budget teams (Real Madrid, Chelsea, and Inter Milan). In international competitions – the soccer world cup, Olympic games, and ice hockey world cup – small, resource-poor countries often humiliate the preeminent national teams.

Among business firms, we observe the same phenomenon. The firms that demonstrate the most outstanding capabilities are not necessarily those with the greatest resource endowments:

- In automobiles, GM has four times the output of Honda and four times the R&D expenditure, yet it is Honda, not GM, that is world leader in power train technology.
- In animated movies, the most successful productions in recent years were by newcomers Pixar (*Toy Story*, *The Incredibles*) and Aardman Animations (*Wallace and Gromit*) rather than by industry giant, Walt Disney.
- In telecom equipment it was the upstart Cisco rather than industry leaders Lucent, Nortel Networks, and Alcatel that established leadership in the new world of package switching.

According to Hamel and Prahalad, it is not the size of a firm's resource base that is the primary determinant of capability, but the firm's ability to *leverage* its resources. Resources can be leveraged in the following ways:

- *Concentrating resources* through the processes of *converging* resources on a few clearly defined and consistent goals; *focusing* the efforts of each group, department, and business unit on individual priorities in a sequential fashion; and *targeting* those activities that have the biggest impact on customers' perceived value.
- *Accumulating resources* through *mining experience* in order to achieve faster learning, and *borrowing* from other firms – accessing their resources and capabilities through alliances, outsourcing arrangements, and the like.
- *Complementing resources* involves increasing their effectiveness through linking them with complementary resources and capabilities. This may involve *blending* product design capabilities with the marketing capabilities needed to communicate these to the market, and *balancing* to ensure that limited resources and capabilities in one area do not hold back the effectiveness of resources and capabilities in another.
- *Conserving resources* involves utilizing resources and capabilities to the fullest by *recycling* them through different products, markets, and product generations; and *co-opting* resources through collaborative arrangements with other companies.³⁵

Replicating Capabilities

Growing capabilities requires that the firm replicates them internally.³⁶ Some of the world's most successful corporations are those that have been able to replicate their capabilities in different product and geographical markets. Ray Kroc's genius was to take the original McDonald's formula and replicate it thousands of times over in building a global chain of hamburger restaurants. Other leading service companies – Starbucks, Mandarin Oriental Hotels, IKEA, eBay – have built global presence on the principle that once a capability has been developed, its replication in another location can be achieved at a low cost.

If routines develop learning-by-doing, and the knowledge that underpins them is tacit, replication is far from easy. Replication requires *systematization* of the knowledge that underlies the capability – typically through the formulation of standard operating procedures. Thus, McDonald's has distilled its business system into operating procedures and training manuals that govern the operation and maintenance of every aspect of its restaurants. This systematization presumes that the firm can more fully articulate the processes that underlie its capabilities. In the case of semiconductor fabrication, these processes are so complex and the know-how involved so deeply embedded that the only way that Intel can replicate its production capabilities is by replicating its lead plant in every detail – a process called “Copy Exactly.”³⁷

Developing New Capabilities

Creating certain resources – a brand or an overseas distribution network – may be difficult, costly, and time consuming, but at least the challenge can be comprehended and planned. Creating organizational capability poses a much higher level of difficulty. If capabilities are based on routines that develop through practice and learning, what can the firm do to establish such routines within a limited time period? We know that capabilities involve teams of resources working together, but, even with the tools of

business process mapping, we typically have sketchy understanding of how people, machines, technology, and organizational culture fit together to achieve a particular level of performance. In the same way that we can only speculate about what makes Tiger Woods the greatest golfer of our time, we are unable fully to diagnose how Dell achieves its brilliance at logistics management or how Electronic Arts has been able to develop video games that continue to set new standards in complexity, sophistication, and player involvement.

Capability as a Result of Early Experiences Organizational capability is *path dependent* – a company’s capabilities today are the result of its history. More importantly, this history will constrain what capabilities the company can perform in the future. To understand the origin of a company’s capabilities, a useful starting point is to study the circumstances that existed and events that occurred at the time of the company’s founding and early development. How did Wal-Mart develop its super-efficient system of warehousing and distribution? This system was not the result of careful planning and design, but of initial conditions: because of its rural locations, the company was unable to get reliable distribution from its suppliers, and so it established its own distribution system. How does one explain Wal-Mart’s amazing commitment to cost efficiency? Its management systems are undoubtedly important, but ultimately it is Wal-Mart’s origins in small-town Arkansas and the values and personality of its founder, Sam Walton, that sustains its obsession with efficiency and cost cutting.

Consider too the world’s largest oil and gas majors (see Table 5.5). Despite long histories of competing together in the same markets, with near-identical products, and

TABLE 5.5 Distinctive Capabilities as a Consequence of Childhood Experiences: The Oil Majors

Company	Distinctive capability	Early history
Exxon	Financial management	Exxon’s predecessor, Standard Oil (NJ), was the holding company for Rockefeller’s Standard Oil Trust
Royal Dutch Shell	Coordinating a decentralized global network of 200+ operating companies	Shell Transport & Trading headquartered in London and founded to sell Russian oil in China and the Far East Royal Dutch Petroleum headquartered in The Hague; founded to exploit Indonesian reserves
BP	“Elephant hunting”	Discovered huge Persian reserves, went on to find Forties field (North Sea) and Prudhoe Bay (Alaska)
ENI	Deal making in politicized environments	The Enrico Mattei legacy; the challenge of managing government relations in post-war Italy
Mobil	Lubricants	Vacuum Oil Co. founded in 1866 to supply patented petroleum lubricants

similar strategies, the majors display very different capability profiles. Exxon and the Royal Dutch Shell Group have shared parallel development for over a century yet have very different capability profiles. Exxon is known for its financial management capabilities exercised through rigorous investment controls and emphasis on cost efficiency. Shell is known for its decentralized, international management capabilities, in particular its adaptability to a wide variety of national environments. These differences can be traced back to the companies' 19th-century origins. Exxon (then Standard Oil New Jersey) was part of Rockefeller's Standard Oil Trust, where it played a key holding company role with responsibilities for the financial management of other parts of the Standard Oil empire. Shell was established to sell Russian oil in China and the Far East, while Royal Dutch was established to exploit Indonesian oil reserves. With head offices thousands of miles away in Europe, it was imperative that the group developed a decentralized, adaptable management style.

Organizational Capability: Rigid or Dynamic? These long periods over which capabilities develop have important implications for firms' capacity for change. The more highly developed a firm's organizational capabilities are, the narrower its repertoire and the more difficult it is for the firm to adapt them to new circumstances. Dorothy Leonard argues that core capabilities are simultaneously *core rigidities* – they inhibit firms' ability to access and develop new capabilities.³⁸ Nevertheless, some companies appear to have the capacity to continually upgrade, extend, and reconfigure their organizational capabilities. David Teece and his colleagues have referred to *dynamic capabilities* as the “firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.”³⁹ There is little consensus in the literature as to what dynamic capabilities are. Eisenhardt and Martin identify dynamic capabilities as routines that enable a firm to reconfigure its resources – these include R&D, new product development and acquisition capabilities. Zollo and Winter define dynamic capabilities as higher level processes through which the firm modifies its operating routines.⁴⁰

What is agreed is that dynamic capabilities are far from common. For most companies highly developed capabilities in existing products and technologies create barriers to developing capabilities in new products and new technologies. When adapting to radical change within an industry, or in exploiting entirely new business opportunities, are new firms at an advantage or disadvantage to established firms? It depends on whether the change or the innovation is competence enhancing or competence destroying. In TV manufacturing, the most successful new entrants were existing producers of radios – the new technology was compatible with their capabilities. However, in most new industries, the most successful firms tend to be startups rather than established firms. In personal computers, it was newcomers such as Dell, Acer, Compaq, and Gateway that emerged as most successful during the 1990s. Among established firms, relatively few (IBM, Hewlett-Packard, and Toshiba) went on to significant success. Many others (e.g., Xerox, GE, Texas Instruments, AT&T, and Olivetti) exited. In wireless telephony, too, it was startups – Vodafone, McCaw Cellular, Orange – that were more successful than established telephone companies.⁴¹

Approaches to Capability Development

So, how do companies go about developing new capabilities? Let us review five approaches commonly utilized.

Acquiring Capabilities: Mergers and Acquisitions If new capabilities can only be developed over long periods, then acquiring a company that has already developed the desired capability can short-circuit the tortuous process of capability development. In technologically fast-moving environments, established firms typically use acquisitions as a means of acquiring specific technical capabilities – Cisco Systems and Microsoft have each benefited substantially from such acquisitions. Microsoft’s adaptation to the internet and its entry into video games was achieved through multiple acquisitions. Each year, Microsoft hosts its VC Summit, where venture capitalists from all over the world are invited to market their companies.

However, using acquisitions as a means of extending a company’s capability base involves major risks. On its own, acquisition does not achieve the intended goal. Once the acquisition has been made, the acquiring company must find a way to integrate the acquiree’s capabilities with its own. All too often, culture clashes, personality of management systems can result in the degradation or destruction of the very capabilities that the acquiring company was seeking.

Accessing Capabilities: Strategic Alliances Given the high cost of acquiring companies, alliances offer a more targeted and cost effective means to access another company’s capabilities. A *strategic alliance* is a cooperative relationship between firms involving the sharing of resources in pursuit of common goals. Long-running technical collaboration between HP and Canon has allowed both firms to enhance their printer technology. Prior to acquisition in 2005, Pixar’s alliance with Disney allowed it to access Disney’s marketing and distribution capabilities. Strategic alliances comprise a wide variety of collaborative relationships, which include joint research, technology-sharing arrangements, shared manufacturing, joint marketing and/or distribution arrangements, and vertical partnerships, to mention but a few. Alliances may involve formal agreements or they may be entirely informal; they may or may not involve ownership links. Alliances may also be for the purpose of *acquiring* the partner’s capabilities through organizational learning.⁴² When General Motors formed its NUMMI joint venture with Toyota, its motive was to learn Toyota’s “lean” approach to manufacturing.⁴³ Where both alliance partners are trying to acquire one another’s capabilities, the result may well be a “competition for competence” that ultimately destabilizes the relationship.⁴⁴

Creating Capabilities Creating organizational capability requires, first, acquiring the necessary resources and, second, integrating these resources. With regard to resource acquisition, particular attention must be given to *organizational culture* – values and behavioral norms are critically important influences on motivation and collaboration. In general, however, it is *integration* that presents the greatest challenge. We know that capabilities are based on routines – coordinated patterns of activity – but we know little about how routines are established. The assumption has been that they “emerge” as a result of learning-by-doing. Recent research, however, has emphasized on the role of management in developing organizational capability through motivation and deliberate learning.⁴⁵ Organizational structure and management systems are of particular importance:

- Capabilities need to be housed within dedicated organizational units if organizational members are to achieve high levels of coordination. Thus, product development is facilitated when undertaken within product development units rather than through a sequence of “over-the-wall” transfers

from one functional department to another. Similarly, capabilities in quality management, change management, corporate social responsibility customer are all best developed when organizational units are dedicated to such activities. Inevitably, aligning organizational structure with the multiple capabilities creates organizational complexity. However, as we shall see in the next chapter, many capabilities are suited to informal structural arrangements.

- Organizations need to take systematic approaches to capability development – the need to create, develop, and maintain organizational capabilities must be built into the design of management systems. The literature emphasizes the roles of search, experimentation, and problem solving in capability development.⁴⁶ Systematic approaches to capability development – including the creation of organizational routines for defensive and offensive maneuvers – are central to the management and coaching of sports teams, but in most business organizations the heavy emphasis on maintaining current operations means that limited attention is devoted to explicit capability development. The management of motivation and incentives in one area that is relatively well developed. The literature places heavy emphasis on the role of strategic intent and performance aspirations in driving capability development. This has implications for both leadership and the design of incentives.

Organizations often discover that the organizational structure, management systems, and culture that support existing capabilities may be unsuitable for new capabilities. To resolve this problem, companies may find it easier to develop new capabilities in new organizational units that are geographically separated from the main company – Strategy Capsule 5.5 offers examples.

Given the complexity and uncertainty of programs to develop new organizational capabilities, an indirect approach may be preferable. If we cannot design new capabilities from scratch, but if we know what types of capabilities are required for different products, then by *pushing* the development of particular products we can *pull* the development of the capabilities that those products require. For such an approach to be successful it must be systematic and incremental. Developing complex capabilities over a significant period of time requires a sequencing of products, where each stage of the sequence has specific capability development goals.⁴⁷ Strategy Capsule 5.6 provides an example. This parallel development of a firm's product portfolio and its base of resources and capabilities is referred to by Hiroyuki Itami as *dynamic resource fit*.⁴⁸ Matsushita utilized this in its international expansion strategy, moving from simple to more complex products:

In every country batteries are a necessity, so they sell well. As long as we bring a few advanced automated pieces of equipment for the processes vital to final product quality, even unskilled labor can produce good products. As they work on this rather simple product, the workers get trained, and this increased skill level then permits us to gradually expand production to items with increasingly higher technology levels, first radios, then televisions.⁴⁹

Ultimately, developing organizational capabilities is about building the know-how of the company, which requires integrating the knowledge of multiple organizational members. One of the most powerful tools for managing such process is *knowledge management*. We shall consider the role and potential of knowledge management in the appendix to this chapter.

STRATEGY CAPSULE 5.5**Incubating Capabilities in Separate Organizational Units**

The model for organizationally separate development units was Lockheed's "skunk works" – a product development team established in Burbank, California during WWII to develop innovative new military aircraft. Since then, a number of companies have used satellite units to develop new organizational capabilities:

- IBM developed its PC at a new unit led by veteran executive Bill Lowe and located in Florida – a thousand miles from IBM's corporate headquarters in New York. Lowe claimed that isolation from IBM's main organization was critical to the team's creation of a product design and business system that were radically different from those of IBM's mainframe business.¹
- The pioneering online financial services company Egg was established by its London-based parent, Prudential Insurance, in the Midlands towns of Dudley and Derby – well away from the London headquarters.

These separate incubator units combine the flexibility and autonomy of a startup, while

drawing on the resources and capabilities of the parent. However, the critical challenge is in reintegrating the new capabilities back into the parent company. Xerox's Palo Alto Research Center (PARC) pioneered many of the technologies that formed the basis of the micro-computer revolution of the 1980s. However, it was much easier for these technologies to flow to nearby competitors – Hewlett-Packard, Apple, Microsoft, and Sun Microsystems – than it was for them to be absorbed by Xerox's east coast establishment.² GM's Saturn has had a similar experience. The Tennessee-based subsidiary achieved its objective of developing new manufacturing and marketing capabilities, but, as yet, these seem to have had little impact on the parent organization.³

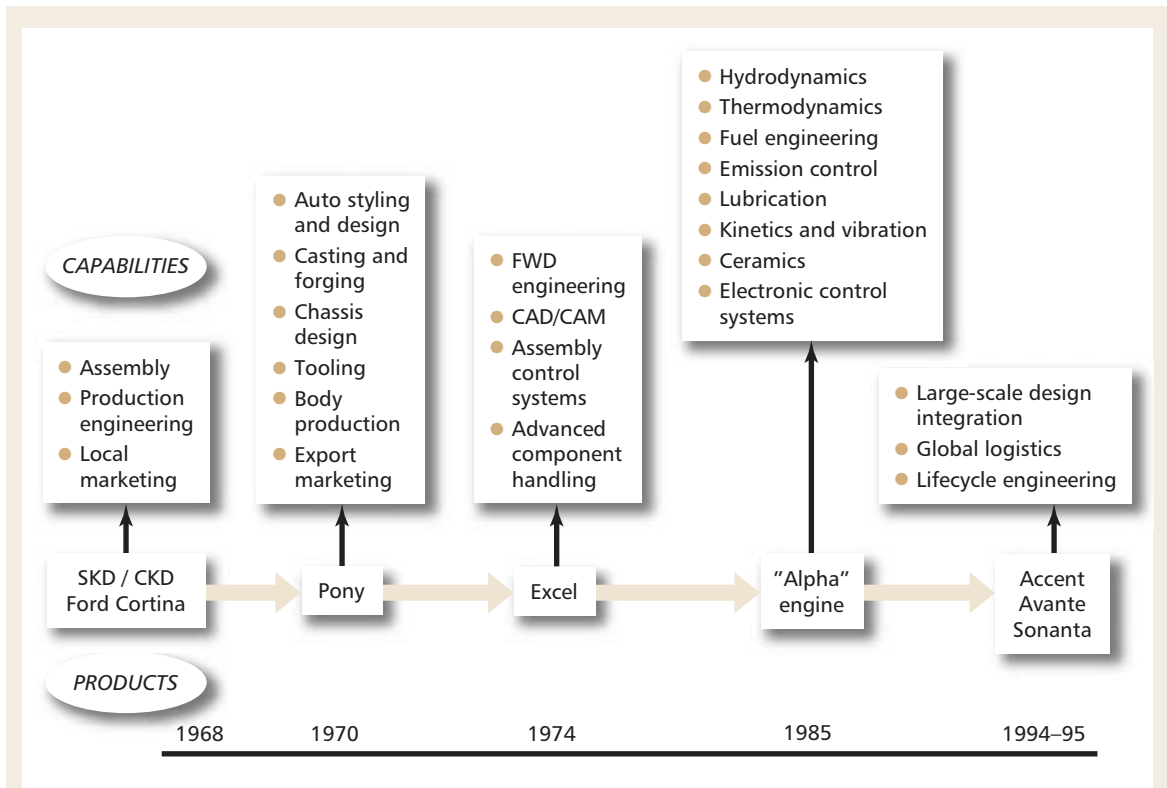
Notes:

- 1 T. Elder, "Lessons from Xerox and IBM," *Harvard Business Review* (July–August 1989): 66–71.
- 2 *Xerox PARC: Innovation without Profit?* ICMR Case Study, 2004.
- 3 J. O'Toole, *Forming the Future: Lessons from the Saturn Corporation* (New York: Harper, 1996).

STRATEGY CAPSULE 5.6**Hyundai Motor: Developing Capabilities through Product Sequencing**

Hyundai's emergence as a world class automobile producer is a remarkable example of capability development over a sequence of compressed phases. Each phase of the devel-

opment process was characterized by a clear objective in terms of product outcome, a tight time deadline, responsibility allocated to a development team, a clear recognition of the



capabilities that needed to be developed in each phase, and an atmosphere of impending crisis should the project not succeed. The first phase was the construction of an assembly plant in the unprecedented time of 18 months in order to build Hyundai's first car – a Ford Cortina

imported in parts. The figure shows the principal phases of Hyundai Motor's development.

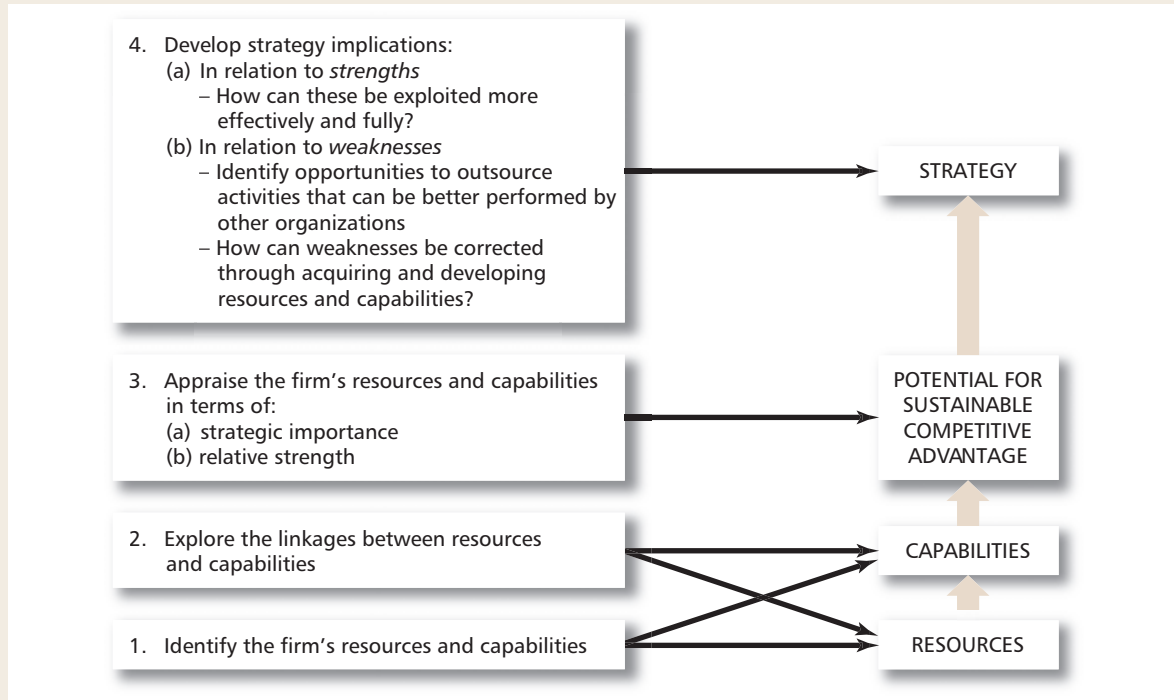
Source: L. Kim, "Crisis construction and organizational learning: Capability building and catching up at Hyundai Motor," *Organizational Science* 9 (1998): 506–21.

Summary

We have shifted the focus of our attention from the external to the internal environment of the firm. This internal environment comprises many features of the firm, but for the purposes of strategy analysis, the key issue is what the firm *can do*. This means looking at the resources of the firm and the way resources combine to create

organizational capabilities. Our interest is the potential for resources and capabilities to establish sustainable competitive advantage. Systematic appraisal of a company's resources and capabilities provides the basis for formulating (or reformulating) strategy. How can the firm deploy its strengths to maximum advantage? How can it

FIGURE 5.9 Summary: a framework for analyzing resources and capabilities



minimize its vulnerability to its weaknesses? How can it develop and extend its capabilities to meet the challenges of the future? Figure 5.9 provides a simplified view of the approach to resource analysis developed in this chapter.

Despite the progress that has been made in the last ten years in our understanding of resources and capabilities, there is much that remains unresolved. We know little about the microstructures of organizational capabilities and how they are established and develop. Can firms develop entirely new capabilities, or must top management accept that distinctive capabilities are the result of experience-based learning over long periods of time through processes that are poorly understood? If that is the case, strategy must be concerned with exploiting, preserving, and developing the firm's existing pool of resources and capabilities, rather than trying to change them. We have much to learn in this area.

Although much of the discussion has been heavy on concepts and theory, the issues are practical. The management systems of most firms devote meticulous attention to the physical and financial assets that are valued on their balance sheets; much less attention has been paid to the critical intangible and human resources of the firm, and even less to the identification and appraisal of organizational capability. Most senior managers are now aware of the importance of their resources and capabilities, but the techniques of identifying, assessing, and developing them are woefully underdeveloped.

Because the resources and capabilities of the firm form the foundation for building competitive advantage, we shall return again and again to the concepts of this chapter. Our next port of call is the structures and systems through which the firm deploys its resources, builds and exercises its capabilities, and implements its strategy.

Self-Study Questions

- 1** In recent years Google has expanded from internet search across a broad range of internet services, including email, photo management, satellite maps, digital book libraries, blogger services, and telephony. To what extent has Google's strategy focused on its resources and capabilities rather than specific customer needs? What are Google's principal resources and capabilities?
- 2** Microsoft's main capabilities relate to the development and marketing of complex computer software and its greatest resource is its huge installed base of its Windows operating system. Does Microsoft's entry into video game consoles indicate that its strategy is becoming divorced from its principal resources and capabilities?
- 3** During 1984–8, Michael Eisner, the newly installed CEO of Walt Disney Company, successfully exploited Disney's existing resources to boost profitability. During the last eight years of Eisner's tenure (1998–2005), however, profitability stagnated and share price declined. To what extent do you think that Eisner focused too heavily on exploiting inherited resources and not enough on developing Disney's capabilities to meet the entertainment needs of a changing world?
- 4** Many companies announce in their corporate communications: "Our people are our most important resource." In terms of the criteria listed in Figure 5.7, can employees be considered to be of the utmost strategic importance?
- 5** Given the profile of VW's resources and capabilities outlined in Table 5.4 and Figure 5.8, what strategy recommendations would you offer VW?
- 6** Apply the approach outlined in the section "Putting Resource and Capability Analysis to Work" to your own business school. Begin by identifying the resources and capabilities relevant to success in the market for business education, appraise the resources and capabilities of your school, then make strategy recommendations regarding such matters as the programs to be offered and the overall positioning and differentiation of the school and its offerings.
- 7** Identify two sports teams: one that is rich in resources (e.g. talented players) but whose capabilities (as indicated by performance) have been poor; one that is resource-poor but has displayed strong team capabilities. What clues can you offer as to the determinants of capabilities among sports teams?
- 8** In 2006, Disney completed its acquisition of the film animation company Pixar for \$7.4 billion. The high purchase price reflected Disney's eagerness to gain Pixar's animation capabilities, its talent (animators, technologists, and storytellers), and its culture of creativity. What risks does Disney face in achieving the goals of this acquisition?

Appendix: Knowledge Management and the Knowledge-based View of the Firm

During the past ten years our thinking about resources and capabilities and their management has been extended and reshaped by a surge of interest in knowledge management. Knowledge management refers to processes and practices through which organizations generate value from knowledge. Initially, knowledge management was primarily concerned with information technology – especially the use of intranets, groupware, and databases for storing, analyzing, and disseminating information. Subsequent developments in knowledge management have been concerned less with data and more with organizational learning – especially the transfer of best practices – and the management of intellectual property. The level of interest in knowledge management is indicated by the number of large corporations that have created the position of chief knowledge officer, the spawning of knowledge management practices by consulting firms, and a flood of books on the subject.

Academic interest in the role of knowledge within organizations represents the confluence of several research streams including resource-based theory, the economics of information, epistemology, evolutionary economics, and the management of technology. The outcome has been a *knowledge-based view of the firm* that considers the firm as a set of knowledge assets with the purpose of deploying these assets to create value.⁵⁰

Is knowledge management a major breakthrough in management practice or mere fad? A growing body of evidence points to the ability of knowledge management to generate substantial gains in performance. At the same time many of its manifestations are highly dubious. *The Wall Street Journal* reports that Saatchi & Saatchi's director of knowledge management is "absorbing everything under the sun," including the implications of breakthrough products such as Japanese pantyhose "embedded with millions of microcapsules of vitamin C and seaweed extract that burst when worn to provide extra nourishment for the limbs."⁵¹ Lucy Kellaway of the *Financial Times* notes that beyond the simple truth that "The subject [of knowledge management] has attracted more needless obfuscation and woolly thinking by academics and consultants than any other."⁵²

My approach is to regard knowledge management and the knowledge-based view of the firm as important extensions of our analysis of resources and capabilities. In terms of resources, knowledge is acknowledged to be the overwhelmingly important productive resource; indeed, the value of people and machines lies primarily in the fact that they embody knowledge. From the strategic viewpoint, knowledge is a particularly interesting resource: many types of knowledge are scarce, much of it is difficult to transfer, and complex forms of knowledge may be very difficult to replicate. Capabilities may be viewed as the manifestation of the knowledge of the organization. Knowledge management offers valuable tools for creating, developing, maintaining, and replicating organizational capabilities.

Types of Knowledge

The single most useful contribution of knowledge management is the recognition that different types of knowledge have very different characteristics. A key distinction is

between *knowing how* and *knowing about*. *Know-how* is primarily *tacit* in nature – it involves skills that are expressed through their performance (riding a bicycle, playing the piano). *Knowing about* is primarily *explicit* – it comprises facts, theories, and sets of instructions. The primary difference between tacit and explicit knowledge lies in their transferability. Explicit knowledge is revealed by its communication: it can be transferred across individuals, across space, and across time. This ease of communication means that explicit knowledge – information especially – has the characteristics of a *public good*: once created, it can be replicated among innumerable users at very low marginal cost (IT has driven these costs to near zero for most types of information). Tacit knowledge, on the other hand, cannot be codified; it can only be observed through its application and acquired through practice, hence its transfer between people is slow, costly, and uncertain.

This distinction has major implications for strategy. If explicit knowledge can be transferred so easily, it is seldom the foundation of sustainable competitive advantage. Because explicit knowledge leaks so quickly to competitors, it is only secure when it is protected, either by intellectual property rights (patents, copyrights, trade secrets) or by secrecy (“The formula for Coca-Cola will be kept in a safe in the vault of our Atlanta headquarters guarded by armed Coca-Cola executives”). The challenge of tacit knowledge is the opposite: if Ms. Jenkins is an incredibly successful salesperson, how can the skills embedded in her brain be transferred to the rest of the salesforce of Acme Delights? For consulting companies, the distinction between tacit (“personalized”) and explicit (“systematized”) knowledge defines their business model and is a central determinant of their strategy.⁵³

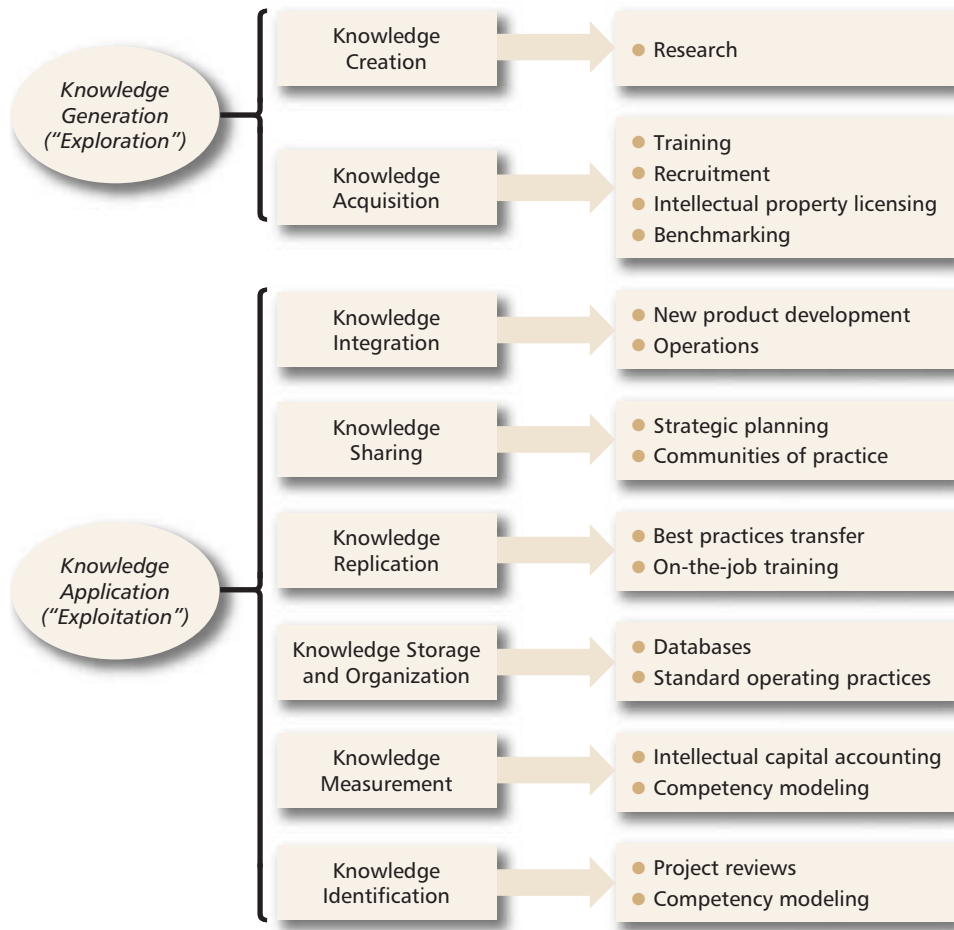
The tacit/explicit distinction has important implications for the distribution of decision-making authority within the company. If the knowledge relevant to decisions is explicit, it can be easily transferred and assembled in one place, hence permitting centralized decision making (treasury activities within companies are typically centralized). If knowledge is primarily tacit, it cannot be transferred and decision making needs to be located among the people where the knowledge lies. If each salesperson’s knowledge of how to make sales is based on their intuition and their understanding of their customers’ idiosyncrasies, such knowledge cannot be easily transferred to their sales managers. It follows that decisions about their working hours and selling tactics should be made by them, not by the sales manager.

Types of Knowledge Process

A second component of knowledge management is understanding the processes through which knowledge is developed and applied. Two categories of knowledge processes can be identified: those that are concerned with increasing the stock of knowledge available to the organization, and those that are concerned with the application of the organization’s knowledge. J.-C. Spender refers to the former as *knowledge generation* and the latter as *knowledge application*. James March’s distinction between *exploration* and *exploitation* recognizes a similar dichotomy.⁵⁴ Within these two broad areas we can identify a number of different knowledge processes, each of which has been associated with particular techniques and approaches to knowledge management (see Figure 5.10).

The best-developed and most widely applied techniques of knowledge management have focused on some of the most basic aspects of knowledge application and exploitation. For example:

FIGURE 5.10 Knowledge processes within the organization



- In the area of *knowledge identification*, companies are increasingly assembling and systematizing information on their knowledge assets. These include assessments and reviews of patent portfolios and providing personnel data that allows each employee to identify the skills and experience of other employees in the organization. A key aspect of such knowledge identification is the recognition of knowledge that is being generated within the organization so that it can subsequently be stored for future use. Such knowledge identification is especially important in project-based organizations to ensure that knowledge developed in one project is not lost to the organization. Systematic post-project reviews are a central theme in the US Army's "lessons learned" procedure, which distills the results of practice maneuvers and simulated battles into tactical guidelines and recommended procedures. A process is applied to learning from actual operations. During the military intervention in Bosnia in 1995, the results of every operation were forwarded to the Center for Lessons Learned to be collected and

codified. Resulting lessons learned were distributed to active units every 72 hours.⁵⁵ By the late 1990s, every major management consulting firm had introduced a system whereby learning from each consulting project was identified, written up, and submitted to a common database.

- *Knowledge measurement* involves measuring and valuing the organization's stock of knowledge and its utilization. Skandia, the Swedish insurance company, has pioneered knowledge metrics with its system of intellectual capital accounting.⁵⁶ Dow Chemical also uses intellectual capital management to link its intellectual property portfolio to shareholder value.
- For knowledge to be efficiently utilized within the organization, *knowledge storage and organization* are critical. The key contribution of information technology to knowledge management has been in creating databases for storing information, for organizing information, and for accessing and communicating information, to facilitate the transfer of and access to knowledge. The backbone of the Booz-Allen & Hamilton's "Knowledge-On-Line" system,⁵⁷ Accenture's "Knowledge Xchange," and AMS's "Knowledge Express"⁵⁸ is an IT system that comprises a database, groupware, dedicated search engine, and an intranet that permits employees to input and access information.
- *Knowledge sharing and replication* involves the transfer of knowledge from one part of the organization (or from one person) to be replicated in another part (or by another individual). A central function of IT-based knowledge management systems is to facilitate such transfer. However, tacit knowledge is not amenable to codification within an IT system. The traditional answer to the problem of replicating tacit knowledge is to use apprenticeships and other forms of on-the-job training. Recently, organizations have discovered the important role played by informal networks in transferring experiential knowledge. These self-organizing *communities of practice* are increasingly being deliberately established and managed as a means of facilitating knowledge sharing and group learning.⁵⁹ Replicating capabilities poses an even greater challenge. Transferring best practices within companies is not simply about creating appropriate incentives; complexity and credibility of the knowledge involved are key impediments.⁶⁰
- *Knowledge integration* represents one of the greatest challenges to any company. Producing most goods and services requires bringing together the knowledge of multiple individuals. The essential task of almost all organizational processes is integrating individual knowledge in an effective and efficient manner. For example, a strategic planning system may be seen as a vehicle for integrating the different knowledge bases of managers at different levels of the organization and from different functions in order to create the best strategy for the company. Similarly with new product development: the key is to integrate the knowledge of many technical experts and across a range of functions. A wide body of evidence points to the effectiveness of project teams in integrating knowledge.⁶¹

Within knowledge generation, it is possible to distinguish between the internal creation of knowledge (*knowledge creation*) and the search to identify and absorb existing knowledge from outside the organization (*knowledge acquisition*). The

mechanisms through which knowledge is acquired from outside the organization are typically well known: hiring skilled employees, acquiring companies or their knowledge resources, benchmarking companies that are recognized as “best-in-class” for certain practices, and learning through alliances and joint ventures. Creativity remains a key challenge for most companies. While most studies of creativity emphasize the role of the individual and the types of environment conducive to individual creativity, Dorothy Leonard has explored the role of groups and group processes in stimulating innovation.⁶² We shall return to creativity and innovation in Chapter 11.

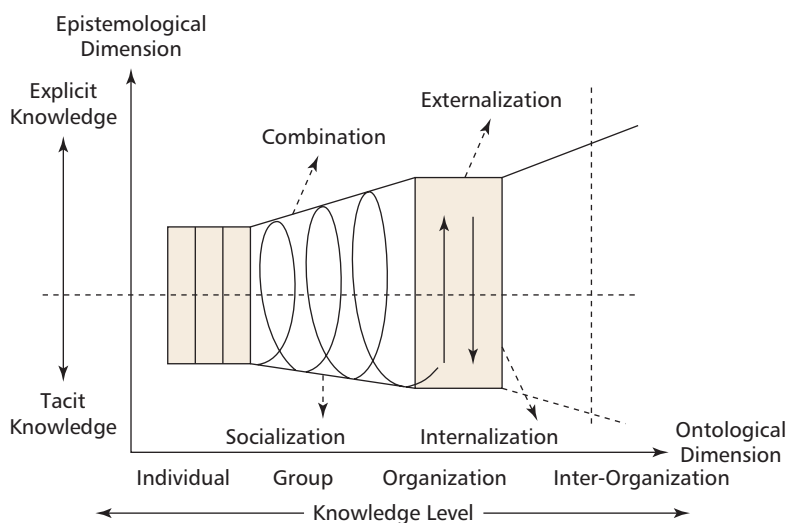
Knowledge Conversion

In practice, knowledge generation and application are not distinct. For example, the application of existing knowledge creates opportunities for learning that increase the stock of knowledge.⁶³ Nonaka’s theory of knowledge creation identifies the processes of *knowledge conversion* – between tacit and explicit and between individual and organizational knowledge – as central to the organization’s building of its knowledge base.⁶⁴ The conversion of knowledge between the different knowledge types (the “epistemological dimension”) and knowledge levels (the “ontological dimension”) forms a knowledge spiral in which the stock of knowledge broadens and deepens (see Figure 5.11). Thus, explicit knowledge is *internalized* into tacit knowledge in the form of intuition, know-how, and routines, while tacit knowledge is *externalized* into explicit knowledge through articulation and codification.

Converting tacit into explicit knowledge is critical to companies that wish to replicate their capabilities:

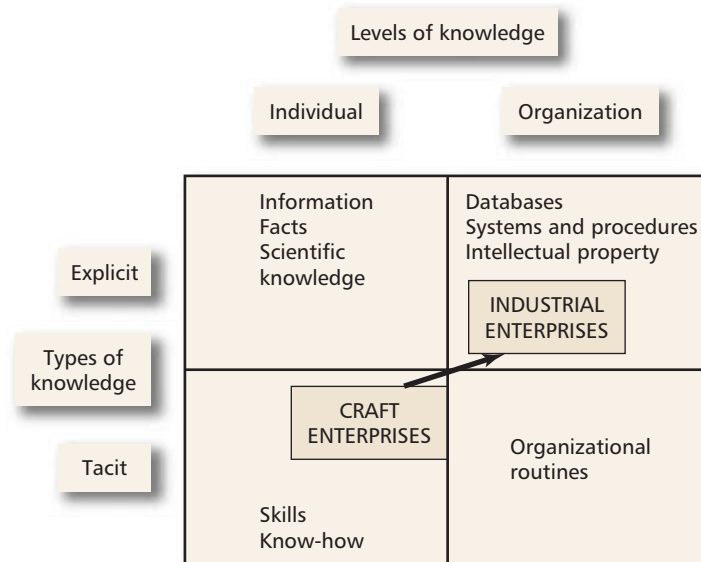
- Henry Ford’s Model T was initially produced on a small scale by skilled metal workers one car at a time. Ford’s assembly-line mass-production technology systematized that tacit knowledge, built it into machines and a business process, and replicated it in Ford plants throughout the world. With the

FIGURE 5.11 Nonaka’s spiral of knowledge creation



SOURCE: I. NONAKA, “ON A KNOWLEDGE-CREATING ORGANIZATION,” PAPER PRESENTED AT AIF NATIONAL CONGRESS (POSMA, OCTOBER 1993).

FIGURE 5.12 Knowledge types and the transformation from craft to industrial enterprises



knowledge built into the system, car workers no longer needed to be skilled craftsmen.

- When Ray Kroc discovered the McDonald brothers' hamburger stand in Riversdale, California, he quickly recognized the potential for systematizing and replicating their process through operating manuals, videos, and training programs. It allows thousands of McDonald's outlets worldwide to produce fast food to exacting standards by a labor force that, for the most part, possesses few culinary skills.

This shift in the knowledge base of the firm, from tacit knowledge located in individuals to explicit knowledge held by the organization is fundamental to the transformation of craft enterprises into industrial enterprises. In addition to Ford and McDonald's, Marriott in hotels, Andersen Consulting (now Accenture) in IT consulting, and Starbucks in coffee shops have pioneered transformation through systematization (see Figure 5.12).

Conclusion

Analysis of the characteristics of knowledge and the process through which it is created and deployed offers striking insights into the principles and practices of management – including the development of organizational capability.

Given the scope of knowledge management and the vast range of tools, techniques, and frameworks that have been developed, where does a company begin to incorporate knowledge management within its management systems? A useful starting point,

is to identify the linkage between knowledge and the basis on which the firm creates value. This can then highlight the key processes through which knowledge is generated and applied. Consider the following examples:

- For Dow Chemical, the core of its value creation is generating intellectual property in new chemical products and processes, and exploiting them through worldwide manufacturing, marketing, and sales. Dow's "Intellectual Capital Management" places its central emphasis on the company's patent portfolio and links its intellectual property to a broad range of intellectual capital variables and processes and ultimately to the company's total value.⁶⁵
- For McKinsey & Co., creating value for clients requires continually building on the knowledge it generates from client assignments, and conceptualizing and sharing that knowledge base. This is achieved through a system that ensures the knowledge generated from each project is captured and made available for subsequent client projects; a matrix structure of industry and functional practices that permits specialized knowledge to be created and stored; and an R&D function in the form of the McKinsey Global Institute.⁶⁶
- For McDonald's Corporation, knowledge management is primarily concerned with implementing the McDonald's system. This is a detailed set of operating practices that extend from the company's values down to the placing of a pickle on the bun of a Big Mac and the procedure for servicing a McDonald's milkshake machine. The essence of the McDonald's system is the systematization of knowledge into a detailed set of rules that are followed in every McDonald's outlet. These explicit operating practices are internalized within employees' cognition and behavior through rigorous attention to training, both in formal training programs at Hamburger University, and in training at individual restaurants.⁶⁷

The design of every knowledge process must take account of the characteristics of the knowledge being deployed. The fundamental distinction here is between explicit and tacit knowledge. Take a simple example of the transfer of best practice between the different fabrication plants of a multinational semiconductor plant. If the knowledge is explicit, then such knowledge can be disseminated in the form of reports, or directives requiring every plant to adopt a new standard operating procedure. If the knowledge is tacit – it is the result of the experience or intuition of a single plant manager – the task is more difficult. Transferring the best practice is likely to require either visits by other plant managers to the innovating plant, or for the innovating plant manager to adopt a consulting role and visit other plants in the group for the purpose of teaching employees there.

It is in the area of managing tacit knowledge (which includes, typically, the major part of the knowledge relevant to organizational capability) where the major challenges and opportunities in knowledge management lie. Information technology has made huge strides in the storage, analysis, and systematization of explicit knowledge. However, the greater part of organizational learning is experience based and intuitive. Identifying this knowledge, and transferring it to other parts of the organization in order to utilize it more effectively, remains a fundamental management challenge.

Notes

- 1 The “resource-based view” is described in J. B. Barney, “Firm Resources and Sustained Competitive Advantage,” *Journal of Management* 17 (1991): 99–120; J. Mahoney and J. R. Pandian, “The Resource-Based View within the Conversation of Strategic Management,” *Strategic Management Journal* 13 (1992): 363–80; M. A. Peterlaf, “The Cornerstones of Competitive Advantage: A Resource-Based View,” *Strategic Management Journal* 14 (1993): 179–92; D. Collis and C. Montgomery, “Competing on Resources: Strategy in the 1990s,” *Harvard Business Review* (July–August 1995): 119–28.
- 2 Ted Levitt (“Marketing Myopia,” *Harvard Business Review*, July–August 1960: 24–47) proposed that the answer to such volatility was for firms to define their markets broadly rather than narrowly. Railroad companies should view themselves as in the transportation business; oil companies should think of themselves as energy companies. The fact is that railroad companies that entered airlines and road transportation generally performed poorly, as did the oil companies that went into coal, nuclear energy, and solar power.
- 3 J. Kay, “Resource Based Strategy,” *Financial Times* (September 27, 1999).
- 4 C. K. Prahalad and G. Hamel, “The Core Competence of the Corporation,” *Harvard Business Review* (May–June 1990): 79–91.
- 5 “Olivetti: On the Ropes,” *Economist* (May 20, 1995): 60–1; “Olivetti Reinvents Itself Once More,” *Wall Street Journal* (February 22, 1999): A.1.
- 6 www.remington-products.com.
- 7 “Eastman Kodak: Meeting the Digital Challenge,” in R. M. Grant, *Cases in Contemporary Strategy Analysis* 6th edn (Oxford, Blackwell, 2008).
- 8 M. Tripsas, “Unraveling the Process of Creative Destruction: Complementary Assets and Incumbent Survival in the Typesetter Industry,” *Strategic Management Journal* 18, Summer Special Issue (1997): 119–42; J. Bower and C. M. Christensen, “Disruptive Technologies: Catching the Wave,” *Harvard Business Review* (January–February 1995): 43–53.
- 9 J. W. Trailer, “On the Theory of Rent and the Mechanics of Profitability,” CSU Chico, 2002 (www.csuchico.edu/~jtrailer/Trailer.doc).
- 10 C. Fombrun, “The Value to be Found in Corporate Reputation,” *Financial Times* Mastering Management Series (December 4, 2000): 8–10.
- 11 www.harrisinteractive.com.
- 12 E. Lawler, “From Job-Based to Competency-Based Organizations,” *Journal of Organizational Behavior* 15 (1994): 3–15; L. Spencer, D. McClelland, and S. Spencer, *Competency Assessment Methods: History and State of the Art* (Hay/McBer Research Group, 1994); L. Spencer and S. Spencer, *Competence At Work: Models for Superior Performance* (New York, Wiley: 1993).
- 13 D. Goleman, *Emotional Intelligence* (New York: Bantam, 1995).
- 14 J. Barney, “Organizational Culture: Can It Be a Source of Sustained Competitive Advantage?,” *Academy of Management Review* 11 (1986): 656–65.
- 15 C. E. Helfat and M. Lieberman, “The Birth of Capabilities: Market Entry and the Importance of Prehistory,” *Industrial and Corporate Change* 12 (2002): 725–60.
- 16 G. Hamel and C. K. Prahalad argue (*Harvard Business Review*, May–June 1992: 164–5) that “the distinction between competencies and capabilities is purely semantic.”
- 17 P. Selznick, *Leadership in Administration: A Sociological Interpretation* (New York: Harper & Row, 1957).
- 18 C. K. Prahalad and G. Hamel, “The Core Competence of the Corporation,” op. cit.
- 19 G. Hamel and C. K. Prahalad, letter, *Harvard Business Review* (May–June 1992): 164–5.
- 20 Porter’s value chain is the main framework of his *Competitive Advantage* (New York: Free Press, 1984). McKinsey & Company refers to the firm’s value chain as its “business system.” See: C. F. Bates, P. Chatterjee, F. W. Gluck, D. Gogel, and A. Puri, “The Business System: A New Tool for Strategy Formulation and Cost Analysis,” in *McKinsey on Strategy* (Boston: McKinsey & Company, 2000).
- 21 R. R. Nelson and S. G. Winter, *An Evolutionary Theory of Economic Change* (Cambridge, MA: Belknap, 1982).
- 22 As a result, specialists perform well in stable environments while generalists do well in variable conditions. (J. Freeman and M. Hannan, “Niche Width and the Dynamics of Organizational Populations,” *American Journal of Sociology* 88, 1984: 1116–45).
- 23 K. B. Clark and T. Fujimoto, *Product Development Performance* (New York: Free Press, 1991).
- 24 See Richard Caves’ discussion of “specific assets” in “International Corporations: The Industrial Economics of Foreign Investment,” *Economica* 38 (1971): 1–27.
- 25 G. Akerlof, “The Market for Lemons: Qualitative Uncertainty and the Market Mechanism,” *Quarterly Journal of Economics* 84 (1970): 488–500.
- 26 J. B. Barney, “Strategic Factor Markets: Expectations, Luck and Business Strategy,” *Management Science* 32 (October 1986): 1231–41.
- 27 “Lenovo Makes Break With IBM Brand,” *New York Times* (April 11, 2006).
- 28 I. Dierickx and K. Cool, “Asset Stock Accumulation and Sustainability of Competitive Advantage,” *Management Science* 35 (1989): 1504–13.
- 29 “Goldman Sachs,” *Economist* (April 29, 2006): 77–80.
- 30 “Real Madrid: A Contingency Theory Explanation of How to Fail,” www.davidbruceallen.com/strategyoped.
- 31 D. Miller, *The Icarus Paradox: How Exceptional Companies Bring About Their Own Downfall* (New York: Harper-Business, 1990).

- 32 Benchnet: The Benchmarking Exchange (www.benchnet.com).
- 33 S. Walleck, D. O'Halloran, and C. Leader, "Benchmarking World-Class Performance," *McKinsey Quarterly* 1 (1991); "The Link Between Management and Productivity," *McKinsey Quarterly* (February 2006).
- 34 C. Markides, *All the Right Moves* (Boston: Harvard Business School Press, 1999).
- 35 G. Hamel and C. K. Prahalad, *Competing for the Future* (Boston: Harvard Business School Press, 1994).
- 36 S. Winter, "The Four Rs of Profitability: Rents, Resources, Routines, and Replication," in C. Montgomery (ed.), *Resource-Based and Evolutionary Theories of the Firm* (Boston: Kluwer, 1995): 147–78.
- 37 "Copy Exactly Factory Strategy" (www.intel.com/pressroom/kits/manufacturing/copy-exactly.htm). See also: G. Szulanski and S. Winter, "Getting it Right the Second Time," *Harvard Business Review* (January 2002): 62–9; and C. Baden-Fuller and S. G. Winter, "Replicating Organizational Knowledge: Principles or Templates?" *Papers on Economics and Evolution*, Max Planck Institute, 2005.
- 38 D. Leonard-Barton, "Core Capabilities and Core Rigidities," *Strategic Management Journal*, Summer Special Issue (1992): 111–26.
- 39 D. J. Teece, G. Pisano, and A. Shuen, "Dynamic Capabilities and Strategic Management," *Strategic Management Journal* 18 (1997): 509–33. The nature of dynamic capability is further explored in K. M. Eisenhardt and J. A. Martin, "Dynamic Capabilities: What Are They?," *Strategic Management Journal* 21 (2000): 1105–21 and H. Volberda, *Building the Flexible Firm* (Oxford: Oxford University Press, 1998).
- 40 M. Zollo and S. G. Winter, "Deliberate Learning and the Evolution of Dynamic Capabilities," *Organization Science* 13 (2002): 339–51. See also: M. Feldman and B. Pentland, "Reconceptualizing Organizational Routines as a Source of Flexibility and Change," *Administrative Science Quarterly* 48 (March 2003).
- 41 Established firms typically fail to survive radical innovation. See, for example, R. M. Henderson and K. B. Clark, "Architectural Innovation: The Reconfiguration of Existing Product Technologies and Failure of Established Firms," *Administrative Science Quarterly* 35 (1990): 9–30; C. Christensen, "The Rigid Disk Drive Industry: A History of Commercial and Technological Turbulence," *Business History Review* 67 (1993): 531–88; M. Tripsas, "Unravelling the Process of Creative Destruction: Complementary Assets and Incumbent Survival in the Typesetter Industry," *Strategic Management Journal* 18 (Summer Special Issue, 1997): 119–42; A. Henderson, "Firm Strategy and Age Dependence: A Contingent View of the Liabilities of Newness, Adolescence and Obsolescence," *Administrative Science Quarterly* 44 (1999): 281–314; S. Karim and W. Mitchell, "Path-Dependent and Path-Breaking Change: Reconfiguring Business Resources Following Acquisitions in the US Medical Sector, 1978–1995," *Strategic Management Journal* 21 (2000): 1016–81.
- 42 See, for example, M. Lyles, "Learning Among Joint-venture Sophisticated Firms," *Management International Review* 28, Special Issue (1988): 85–98; A. Mody, "Learning Through Alliances," *Journal of Economic Behavior and Organization* 20 (1993): 151–70; D. C. Mowery, J. E. Oxley, and B. S. Silverman, "Strategic Alliances and Interfirm Knowledge Transfer," *Strategic Management Journal* 17, Winter Special Issue (1996): 77–93; A. C. Inkpen and M. M. Crossan, "Believing Is Seeing: Joint Ventures and Organizational Learning," *Journal of Management Studies* 32 (1995): 595–618.
- 43 J. A. Badaracco, *The Knowledge Link: How Firms Compete Through Strategic Alliances* (Boston: Harvard Business School Press, 1991).
- 44 G. Hamel, "Competition for Competence and Interpartner Learning within International Strategic Alliances," *Strategic Management Journal* 12, Summer Special Issue (1991): 83–103.
- 45 S. G. Winter, "The Satisficing Principle in Capability Learning," *Strategic Management Journal* 21 (2000): 981–96; G. Gavetti and D. Levinthal, "Looking Forward and Looking Backward: Cognitive and Experiential Search," *Administrative Science Quarterly* 45 (2000): 113–37.
- 46 G. Dosi, R. R. Nelson and S. G. Winter (eds) *The Nature and Dynamics of Organizational Capabilities* (Oxford: Oxford University Press, 2001).
- 47 C. E. Helfat and Ruth S. Raubitschek, "Product Sequencing: Co-evolution of Knowledge, Capabilities and Products," *Strategic Management Journal* 21 (2000): 961–79.
- 48 H. Itami, *Mobilizing Invisible Assets* (Boston: Harvard University Press, 1987): 125.
- 49 A. Takahashi, *What I Learned from Konosuke Matsushita* (Tokyo: Jitsugyo no Nihonsha, 1980); in Japanese, quoted by Itami, op. cit.: 25.
- 50 "The knowledge-based view" offers a rationale for the firm that is based on its effectiveness as an institution for creating, assembling, and transforming knowledge into goods and services. See: B. Kogut and U. Zander, "Knowledge of the Firm, Combinative Capabilities and the Replication of Technology," *Organization Science* 3 (1992): 387–99; R. M. Grant, "Toward a Knowledge-based Theory of the Firm," *Strategic Management Journal* 17, Winter Special Issue (1996): 109–22.
- 51 "Saatchi's 'Manager of Knowledge' Keeps Track of What's Trendy," *Wall Street Journal* (February 28, 1997): B.16.
- 52 Lucy Kellaway column, *Financial Times* (June 23, 1999): 13.
- 53 M. Hansen, N. Nohria, and T. Tierney, "What's Your Strategy for Managing Knowledge?," *Harvard Business Review* (March 1999): 106–16.
- 54 J.-C. Spender, "Limits to Learning from the West," *The International Executive* 34 (September/October 1992): 389–410; J. G. March, "Exploration and Exploitation in

- Organizational Learning,” *Organization Science* 2 (1991): 71–87.
- 55 “Lessons Learned: Army Devises System to Decide What Does and What Does Not Work,” *Wall Street Journal* (May 23, 1997): A1 and A10.
- 56 L. Edvinsson and S. Malone, *Intellectual Capital: Realizing Your Company’s True Value by Finding its Hidden Brainpower* (New York: Harper Business, 1997); D. Marchand and J. Roos, *Skandia AFS: Measuring and Visualizing Intellectual Capital*, Case No. GM 624 (Lausanne: IMD, 1996).
- 57 *Cultivating Capabilities to Innovate: Booz-Allen & Hamilton*, Case No. 9-698-027 (Boston: Harvard Business School, 1997).
- 58 *American Management Systems: The Knowledge Centers*, Case No. 9-697-068 (Boston: Harvard Business School, 1997).
- 59 E. C. Wenger and W. M. Snyder, “Communities of Practice: The Organizational Frontier,” *Harvard Business Review* (January–February 2000).
- 60 G. Szulanski, “Exploring Internal Stickiness: Impediments to the Transfer of Best Practices within the Firm,” *Strategic Management Journal* 17, Winter Special Issue (1996): 27–44.
- 61 See, for example, K. B. Clark and T. Fujimoto, *Product Development Performance* (New York: Free Press, 1991); and K. Imai, I. Nonaka, and H. Takeuchi, “Managing the New Product Development Process: How Japanese Companies Learn and Unlearn,” in K. Clark, R. Hayes, and C. Lorenz (eds), *The Uneasy Alliance* (Boston: Harvard Business School Press, 1985).
- 62 D. Leonard and S. Sensiper, “The Role of Tacit Knowledge in Group Innovation,” *California Management Review* 40 (Spring 1998): 112–32; Dorothy Leonard, *The Wellsprings of Knowledge* (Boston: Harvard Business School Press, 1996).
- 63 P. McNamara, “Managing the Tension Between Knowledge Exploration and Exploitation: The Case of UK Biotechnology,” Ph.D. thesis (City University Business School, London, 2000).
- 64 I. Nonaka and H. Takeuchi, *The Knowledge-Creating Company* (Oxford: Oxford University Press, 1995).
- 65 G. Petrash, “Dow’s Journey to a Knowledge Value Management Culture,” *European Management Journal* 14 (August 1996): 365–73.
- 66 *McKinsey & Company: Managing Knowledge and Learning*, Case No. 9-396-357 (Boston: Harvard Business School, 1996).
- 67 As McDonald’s has faced new challenges – internationalization and trends towards healthier eating – it has changed its systems for managing knowledge, emphasizing decentralized product development and internal knowledge sharing through Food Improvement Teams and corporate blogs.