The Core Competence of the Corporation

C.K. Prahalad and Gary Hamel

Harvard Business Review

90311

HBR
MAY–JUNE 1990

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The most powerful way to prevail in global competition is still invisible to many companies. During the 1980s, top executives were judged on their ability to restructure, declutter, and delayer their corporations. In the 1990s, they'll be judged on their ability to identify, cultivate, and exploit the core competencies that make growth possible—indeed, they'll have to rethink the concept of the corporation itself.

Consider the last ten years of GTE and NEC. In the early 1980s, GTE was well positioned to become a major player in the evolving information technology industry. It was active in telecommunications. Its operations spanned a variety of businesses including telephones, switching and transmission systems, digital PABX, semiconductors, packet switching, satellites, defense systems, and lighting products. And GTE's Entertainment Products Group, which produced Sylvania color TVs, had a position in related display technologies. In 1980, GTE's sales were $9.98 billion, and net cash flow was $1.73 billion. NEC, in contrast, was much smaller, at $3.8 billion in sales. It had a comparable technological base and computer businesses, but it had no experience as an operating telecommunications company.

Yet look at the positions of GTE and NEC in 1988. GTE's 1988 sales were $16.46 billion, and NEC's sales were considerably higher at $21.89 billion. GTE has, in effect, become a telephone operating company with a position in defense and lighting products. GTE's other businesses are small in global terms. GTE has divested Sylvania TV and Telenet, put switching, transmission, and digital PABX into joint ventures, and closed down semiconductors. As a result, the international position of GTE has eroded. Non-U.S. revenue as a percent of total revenue dropped from 20% to 15% between 1980 and 1988.

NEC has emerged as the world leader in semiconductors and as a first-tier player in telecommunications products and computers. It has consolidated its position in mainframe computers. It has moved beyond public switching and transmission to include such lifestyle products as mobile telephones, facsimile machines, and laptop computers—bridging the gap between telecommunications and office automation. NEC is the only company in the world to be in the top five in revenue in telecommunications, semiconductors, and mainframes. Why did these two companies, starting with comparable business portfolios, perform so differently? Largely because NEC conceived of itself in terms of "core competencies," and GTE did not.

C.K. Prahalad is professor of corporate strategy and international business at the University of Michigan. Gary Hamel is lecturer in business policy and management at the London Business School. Their most recent HBR article, "Strategic Intent" (May–June 1989), won the 1989 McKinsey Award for excellence. *This article is based on research funded by the Gatsby Charitable Foundation.*

Rethinking the Corporation

Once, the diversified corporation could simply point its business units at particular end product markets and admonish them to become world leaders. But with market boundaries changing ever more quickly, targets are elusive and capture is at best temporary. A few companies have proven themselves adept at inventing new markets, quickly entering emerging markets, and dramatically shifting patterns of customer choice in established markets. These are the ones to emulate. The critical task for management is to create an organization capable of infusing products with irresistible functionality or, better yet, creating products that customers need but have not yet even imagined.

This is a deceptively difficult task. Ultimately, it requires radical change in the management of major companies. It means, first of all, that top managements of Western companies must assume responsibility for competitive decline. Everyone knows about high interest rates, Japanese protectionism, outdated antitrust laws, obstreperous unions, and impatient investors. What is harder to see, or harder to acknowledge, is how little added momentum companies actually get from political or macroeconomic "relief." Both the theory and practice of Western management have created a drag on our forward motion. It is the principles of management that are in need of reform.

NEC versus GTE, again, is instructive and only one of many such comparative cases we analyzed to understand the changing basis for global leadership. Early in the 1970s, NEC articulated a strategic intent to exploit the convergence of computing and communications, what it called "C&C."[1] Success, top management reckoned, would hinge on acquiring *competencies,* particularly in semiconductors. Management adopted an appropriate "strategic architecture," summarized by C&C, and then communicated its intent to the whole organization and the outside world during the mid-1970s.

NEC constituted a "C&C Committee" of top managers to oversee the development of core products and core competencies. NEC put in place coordination groups and committees that cut across the interests of individual businesses. Consistent with its strategic architecture, NEC shifted enormous resources to strengthen its position in components and central processors. By using collaborative arrangements to multiply internal resources, NEC was able to accumulate a broad array of core competencies.

1. For a fuller discussion, see our article, "Strategic Intent" HBR May–June 1989, p. 63.

NEC carefully identified three interrelated streams of technological and market evolution. Top management determined that computing would evolve from large mainframes to distributed processing, components from simple ICs to VLSI, and communications from mechanical cross-bar exchange to complex digital systems we now call ISDN. As things evolved further, NEC reasoned, the computing, communications, and components businesses would so overlap that it would be very hard to distinguish among them, and that there would be enormous opportunities for any company that had built the competencies needed to serve all three markets.

NEC top management determined that semiconductors would be the company's most important "core product." It entered into myriad strategic alliances—over 100 as of 1987—aimed at building competencies rapidly and at low cost. In mainframe computers, its most noted relationship was with Honeywell and Bull. Almost all the collaborative arrangements in the semiconductor-component field were oriented toward technology access. As they entered collaborative arrangements, NEC's operating managers understood the rationale for these alliances and the goal of internalizing partner skills. NEC's director of research summed up its competence acquisition during the 1970s and 1980s this way: "From an investment standpoint, it was much quicker and cheaper to use foreign technology. There wasn't a need for us to develop new ideas."

No such clarity of strategic intent and strategic architecture appeared to exist at GTE. Although senior executives discussed the implications of the evolving information technology industry, no commonly accepted view of which competencies would be required to compete in that industry were communicated widely. While significant staff work was done to identify key technologies, senior line managers continued to act as if they were managing independent business units. Decentralization made it difficult to focus on core competencies. Instead, individual businesses became increasingly dependent on outsiders for critical skills, and collaboration became a route to staged exits. Today, with a new management team in place, GTE has repositioned itself to apply its competencies to emerging markets in telecommunications services.

The Roots of Competitive Advantage

The distinction we observed in the way NEC and GTE conceived of themselves—a portfolio of competencies versus a portfolio of businesses—was re-

peated across many industries. From 1980 to 1988, Canon grew by 264%, Honda by 200%. Compare that with Xerox and Chrysler. And if Western managers were once anxious about the low cost and high quality of Japanese imports, they are now overwhelmed by the pace at which Japanese rivals are inventing new markets, creating new products, and enhancing them. Canon has given us personal copiers; Honda has moved from motorcycles to four-wheel off-road buggies. Sony developed the 8mm camcorder, Yamaha, the digital piano. Komatsu developed an underwater remote-controlled bulldozer, while Casio's latest gambit is a small-screen color LCD television. Who would have anticipated the evolution of these vanguard markets?

In more established markets, the Japanese challenge has been just as disquieting. Japanese companies are generating a blizzard of features and functional enhancements that bring technological sophistication to everyday products. Japanese car producers have been pioneering four-wheel steering, four-valve-per-cylinder engines, in-car navigation systems, and sophisticated electronic engine-management systems. On the strength of its product features, Canon is now a player in facsimile transmission machines, desktop laser printers, even semiconductor manufacturing equipment.

In the short run, a company's competitiveness derives from the price/performance attributes of current products. But the survivors of the first wave of global competition, Western and Japanese alike, are all converging on similar and formidable standards for product cost and quality—minimum hurdles for continued competition, but less and less important as sources of differential advantage. In the long run, competitiveness derives from an ability to build, at lower cost and more speedily than competitors, the core competencies that spawn unanticipated products. The real sources of advantage are to be found in management's ability to consolidate corporatewide technologies and production skills into competencies that empower individual businesses to adapt quickly to changing opportunities.

Senior executives who claim that they cannot build core competencies either because they feel the autonomy of business units is sacrosanct or because their feet are held to the quarterly budget fire should think again. The problem in many Western companies is not that their senior executives are any less capable than those in Japan nor that Japanese companies possess greater technical capabilities. Instead, it is their adherence to a concept of the corporation that unnecessarily limits the ability of individual businesses to fully exploit the deep reservoir of technological capability that many American and European companies possess.

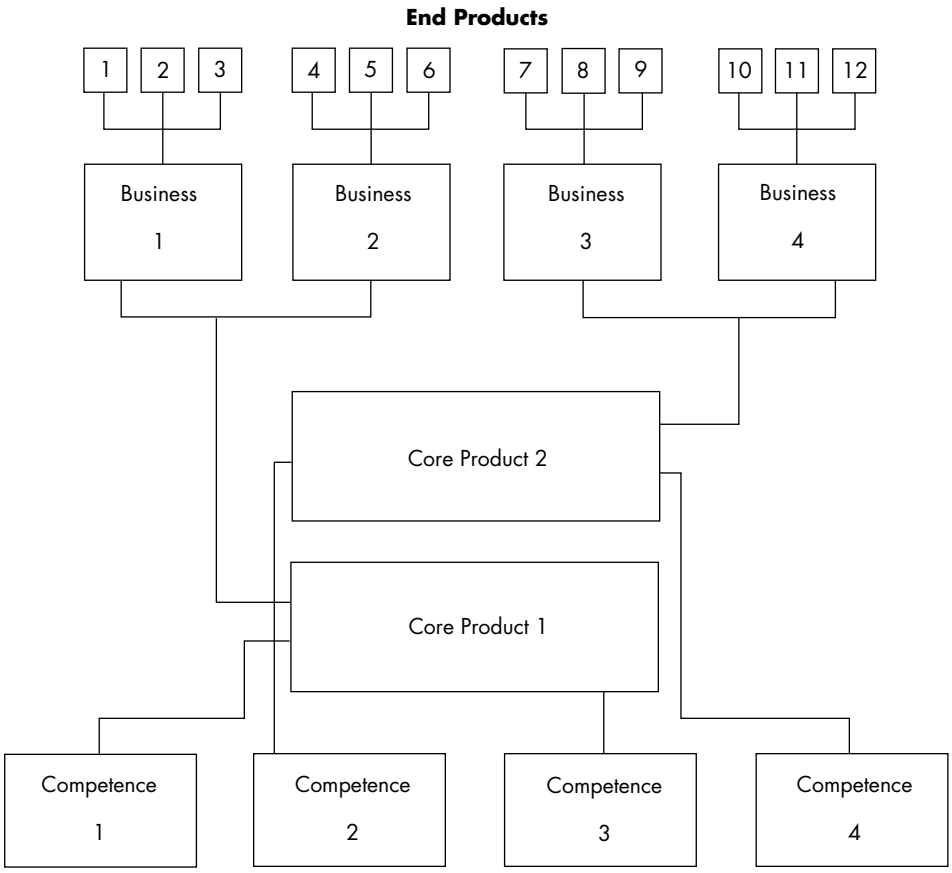
The diversified corporation is a large tree. The trunk and major limbs are core products, the smaller branches are business units; the leaves, flowers, and fruit are end products. The root system that provides nourishment, sustenance, and stability is the core competence. You can miss the strength of competitors by looking only at their end products, in the same way you miss the strength of a tree if you look only at its leaves. (See the chart "Competencies: The Roots of Competitiveness.")

Core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies. Consider Sony's capacity to miniaturize or Philips's optical-media expertise. The theoretical knowledge to put a radio on a chip does not in itself assure a company the skill to produce a miniature radio no bigger than a business card. To bring off this feat, Casio must harmonize know-how in miniaturization, microprocessor design, material science, and ultrathin precision casing—the same skills it applies in its miniature card calculators, pocket TVs, and digital watches.

If core competence is about harmonizing streams of technology, it is also about the organization of work and the delivery of value. Among Sony's competencies is miniaturization. To bring miniaturization to its products, Sony must ensure that technologists, engineers, and marketers have a shared understanding of customer needs and of technological possibilities. The force of core competence is felt as decisively in services as in manufacturing. Citicorp was ahead of others investing in an operating system that allowed it to participate in world markets 24 hours a day. Its competence in systems has provided the company the means to differentiate itself from many financial service institutions.

Core competence is communication, involvement, and a deep commitment to working across organizational boundaries. It involves many levels of people and all functions. World-class research in, for example, lasers or ceramics can take place in corporate laboratories without having an impact on any of the businesses of the company. The skills that together constitute core competence must coalesce around individuals whose efforts are not so narrowly focused that they cannot recognize the opportunities for blending their functional expertise with those of others in new and interesting ways.

Core competence does not diminish with use. Unlike physical assets, which do deteriorate over time, competencies are enhanced as they are applied and shared. But competencies still need to be nurtured and protected; knowledge fades if it is not used. Competencies are the glue that binds existing businesses. They are also the engine for new business develop-



The corporation, like a tree, grows from its roots. Core products are nourished by competencies and engender business units, whose fruit are end products.

ment. Patterns of diversification and market entry may be guided by them, not just by the attractiveness of markets.

Consider 3M's competence with sticky tape. In dreaming up businesses as diverse as "Post-it" notes, magnetic tape, photographic film, pressure-sensitive tapes, and coated abrasives, the company has brought to bear widely shared competencies in substrates, coatings, and adhesives and devised various ways to combine them. Indeed, 3M has invested consistently in them. What seems to be an extremely diversified portfolio of businesses belies a few shared core competencies.

In contrast, there are major companies that have had the potential to build core competencies but failed to do so because top management was unable to conceive of the company as anything other than a collection of discrete businesses. GE sold much of its consumer electronics business to Thomson of France, arguing that it was becoming increasingly difficult to maintain its competitiveness in this sector. That was undoubtedly so, but it is ironic that it sold several key businesses to competitors who were already competence leaders—Black & Decker in small electrical motors, and Thomson, which was eager to build its competence in microelectronics and had learned from the Japanese that a position in consumer electronics was vital to this challenge.

Management trapped in the strategic business unit (SBU) mind-set almost inevitably finds its individual businesses dependent on external sources for critical components, such as motors or compressors. But these are not just components. They are core products that contribute to the competitiveness of a wide range of end products. They are the physical embodiments of core competencies.

How Not to Think of Competence

Since companies are in a race to build the competencies that determine global leadership, successful companies have stopped imagining themselves as

bundles of businesses making products. Canon, Honda, Casio, or NEC may seem to preside over portfolios of businesses unrelated in terms of customers, distribution channels, and merchandising strategy. Indeed, they have portfolios that may seem idiosyncratic at times: NEC is the only global company to be among leaders in computing, telecommunications, and semiconductors *and* to have a thriving consumer electronics business.

But looks are deceiving. In NEC, digital technology, especially VLSI and systems integration skills, is fundamental. In the core competencies underlying them, disparate businesses become coherent. It is Honda's core competence in engines and power trains that gives it a distinctive advantage in car, motorcycle, lawn mower, and generator businesses. Canon's core competencies in optics, imaging, and microprocessor controls have enabled it to enter, even dominate, markets as seemingly diverse as copiers, laser printers, cameras, and image scanners. Philips worked for more than 15 years to perfect its optical-media (laser disc) competence, as did JVC in building a leading position in video recording. Other examples of core competencies might include mechantronics (the ability to marry mechanical and electronic engineering), video displays, bioengineering, and microelectronics. In the early stages of its competence building, Philips could not have imagined all the products that would be spawned by its optical-media competence, nor could JVC have anticipated miniature camcorders when it first began exploring videotape technologies.

Unlike the battle for global brand dominance, which is visible in the world's broadcast and print media and is aimed at building global "share of mind," the battle to build world-class competencies is invisible to people who aren't deliberately looking for it. Top management often tracks the cost and quality of competitors' products, yet how many managers untangle the web of alliances their Japanese competitors have constructed to acquire competencies at low cost? In how many Western boardrooms is there an explicit, shared understanding of the competencies the company must build for world leadership? Indeed, how many senior executives discuss the crucial distinction between competitive strategy at the level of a business and competitive strategy at the level of an entire company?

Let us be clear. Cultivating core competence does *not* mean outspending rivals on research and development. In 1983, when Canon surpassed Xerox in worldwide unit market share in the copier business, its R&D budget in reprographics was but a small fraction of Xerox's. Over the past 20 years, NEC has spent less on R&D as a percentage of sales than almost all of its American and European competitors.

Nor does core competence mean shared costs, as when two or more SBUs use a common facility—a plant, service facility, or sales force—or share a common component. The gains of sharing may be substantial, but the search for shared costs is typically a post hoc effort to rationalize production across existing businesses, not a premeditated effort to build the competencies out of which the businesses themselves grow.

Building core competencies is more ambitious and different than integrating vertically, moreover. Managers deciding whether to make or buy will start with end products and look upstream to the efficiencies of the supply chain and downstream toward distribution and customers. They do not take inventory of skills and look forward to applying them in nontraditional ways. (Of course, decisions about competencies *do* provide a logic for vertical integration. Canon is not particularly integrated in its copier business, except in those aspects of the vertical chain that support the competencies it regards as critical.)

Identifying Core Competencies—And Losing Them

At least three tests can be applied to identify core competencies in a company. First, a core competence provides potential access to a wide variety of markets. Competence in display systems, for example, enables a company to participate in such diverse businesses as calculators, miniature TV sets, monitors for laptop computers, and automotive dashboards—which is why Casio's entry into the handheld TV market was predictable. Second, a core competence should make a significant contribution to the perceived customer benefits of the end product. Clearly, Honda's engine expertise fills this bill.

Finally, a core competence should be difficult for competitors to imitate. And it *will* be difficult if it is a complex harmonization of individual technologies and production skills. A rival might acquire some of the technologies that comprise the core competence, but it will find it more difficult to duplicate the more or less comprehensive pattern of internal coordination and learning. JVC's decision in the early 1960s to pursue the development of a videotape competence passed the three tests outlined here. RCA's decision in the late 1970s to develop a stylus-based video turntable system did not.

Few companies are likely to build world leadership in more than five or six fundamental competencies. A company that compiles a list of 20 to 30 capabilities has probably not produced a list of core competencies. Still, it is probably a good discipline to generate a list of this sort and to see aggregate capabil-

ities as building blocks. This tends to prompt the search for licensing deals and alliances through which the company may acquire, at low cost, the missing pieces.

Most Western companies hardly think about competitiveness in these terms at all. It is time to take a tough-minded look at the risks they are running. Companies that judge competitiveness, their own and their competitors', primarily in terms of the price/performance of end products are courting the erosion of core competencies—or making too little effort to enhance them. The embedded skills that give rise to the next generation of competitive products cannot be "rented in" by outsourcing and OEM-supply relationships. In our view, too many companies have unwittingly surrendered core competencies when they cut internal investment in what they mistakenly thought were just "cost centers" in favor of outside suppliers.

Consider Chrysler. Unlike Honda, it has tended to view engines and power trains as simply one more component. Chrysler is becoming increasingly dependent on Mitsubishi and Hyundai: between 1985 and 1987, the number of outsourced engines went from 252,000 to 382,000. It is difficult to imagine Honda yielding manufacturing responsibility, much less design, of so critical a part of a car's function to an outside company—which is why Honda has made such an enormous commitment to Formula One auto racing. Honda has been able to pool its engine-related technologies; it has parlayed these into a corporatewide competency from which it develops world-beating products, despite R&D budgets smaller than those of GM and Toyota.

Of course, it is perfectly possible for a company to have a competitive product line up but be a laggard in developing core competencies—at least for a while. If a company wanted to enter the copier business today, it would find a dozen Japanese companies more than willing to supply copiers on the basis of an OEM private label. But when fundamental technologies changed or if its supplier decided to enter the market directly and become a competitor, that company's product line, along with all of its investments in marketing and distribution, could be vulnerable. Outsourcing can provide a shortcut to a more competitive product, but it typically contributes little to building the people-embodied skills that are needed to sustain product leadership.

Nor is it possible for a company to have an intelligent alliance or sourcing strategy if it has not made a choice about where it will build competence leadership. Clearly, Japanese companies have benefited from alliances. They've used them to learn from Western partners who were not fully committed to preserving core competencies of their own. As we've argued in these pages before, learning within an alliance takes a positive commitment of resources—travel, a pool of dedicated people, test-bed facilities, time to internalize and test what has been learned.[2] A company may not make this effort if it doesn't have clear goals for competence building.

Another way of losing is forgoing opportunities to establish competencies that are evolving in existing businesses. In the 1970s and 1980s, many American and European companies—like GE, Motorola, GTE, Thorn, and GEC—chose to exit the color television business, which they regarded as mature. If by "mature" they meant that they had run out of new product ideas at precisely the moment global rivals had targeted the TV business for entry, then yes, the industry was mature. But it certainly wasn't mature in the sense that all opportunities to enhance and apply video-based competencies had been exhausted.

In ridding themselves of their television businesses, these companies failed to distinguish between divesting the business and destroying their video media-based competencies. They not only got out of the TV business but they also closed the door on a whole stream of future opportunities reliant on video-based competencies. The television industry, considered by many U.S. companies in the 1970s to be unattractive, is today the focus of a fierce public policy debate about the inability of U.S. corporations to benefit from the $20-billion-a-year opportunity that HDTV will represent in the mid- to late 1990s. Ironically, the U.S. government is being asked to fund a massive research project—in effect, to compensate U.S. companies for their failure to preserve critical core competencies when they had the chance.

In contrast, one can see a company like Sony reducing its emphasis on VCRs (where it has not been very successful and where Korean companies now threaten), without reducing its commitment to video-related competencies. Sony's Betamax led to a debacle. But it emerged with its videotape recording competencies intact and is currently challenging Matsushita in the 8mm camcorder market.

There are two clear lessons here. First, the costs of losing a core competence can be only partly calculated in advance. The baby may be thrown out with the bath water in divestment decisions. Second, since core competencies are built through a process of continuous improvement and enhancement that may span a decade or longer, a company that has failed to invest in core competence building will find it very difficult to enter an emerging market, unless, of course, it will be content simply to serve as a distribution channel.

2. "Collaborate with Your Competitors and Win," HBR January–February 1989, p. 133, with Yves L. Doz.

American semiconductor companies like Motorola learned this painful lesson when they elected to forgo direct participation in the 256k generation of DRAM chips. Having skipped this round, Motorola, like most of its American competitors, needed a large infusion of technical help from Japanese partners to rejoin the battle in the 1-megabyte generation. When it comes to core competencies, it is difficult to get off the train, walk to the next station, and then reboard.

From Core Competencies to Core Products

The tangible link between identified core competencies and end products is what we call the core products—the physical embodiments of one or more core competencies. Honda's engines, for example, are core products, linchpins between design and development skills that ultimately lead to a proliferation of end products. Core products are the components or subassemblies that actually contribute to the value of the end products. Thinking in terms of core products forces a company to distinguish between the brand share it achieves in end product markets (for example, 40% of the U.S. refrigerator market) and the manufacturing share it achieves in any particular core product (for example, 5% of the world share of compressor output).

Canon is reputed to have an 84% world manufacturing share in desktop laser printer "engines," even though its brand share in the laser printer business is minuscule. Similarly, Matsushita has a world manufacturing share of about 45% in key VCR components, far in excess of its brand share (Panasonic, JVC, and others) of 20%. And Matsushita has a commanding core product share in compressors worldwide, estimated at 40%, even though its brand share in both the air-conditioning and refrigerator businesses is quite small.

It is essential to make this distinction between core competencies, core products, and end products because global competition is played out by different rules and for different stakes at each level. To build or defend leadership over the long term, a corporation will probably be a winner at each level. At the level of core competence, the goal is to build world leadership in the design and development of a particular class of product functionality—be it compact data storage and retrieval, as with Philips's optical-media competence, or compactness and ease of use, as with Sony's micromotors and microprocessor controls.

To sustain leadership in their chosen core competence areas, these companies *seek to maximize their world manufacturing share in core products.* The manufacture of core products for a wide variety of external (and internal) customers yields the revenue and market feedback that, at least partly, determines the pace at which core competencies can be enhanced and extended. This thinking was behind JVC's decision in the mid-1970s to establish VCR supply relationships with leading national consumer electronics companies in Europe and the United States. In supplying Thomson, Thorn, and Telefunken (all independent companies at that time) as well as U.S. partners, JVC was able to gain the cash and the diversity of market experience that ultimately enabled it to outpace Philips and Sony. (Philips developed videotape competencies in parallel with JVC, but it failed to build a worldwide network of OEM relationships that would have allowed it to accelerate the refinement of its videotape competence through the sale of core products.)

JVC's success has not been lost on Korean companies like Goldstar, Sam Sung, Kia, and Daewoo, who are building core product leadership in areas as diverse as displays, semiconductors, and automotive engines through their OEM-supply contracts with Western companies. Their avowed goal is to capture investment initiative away from potential competitors, often U.S. companies. In doing so, they accelerate their competence-building efforts while "hollowing out" their competitors. By focusing on competence and embedding it in core products, Asian competitors have built up advantages in component markets first and have then leveraged off their superior products to move downstream to build brand share. And they are not likely to remain the low-cost suppliers forever. As their reputation for brand leadership is consolidated, they may well gain price leadership. Honda has proven this with its Acura line, and other Japanese car makers are following suit.

Control over core products is critical for other reasons. A dominant position in core products allows a company to shape the evolution of applications and end markets. Such compact audio disc-related core products as data drives and lasers have enabled Sony and Philips to influence the evolution of the computer-peripheral business in optical-media storage. As a company multiplies the number of application arenas for its core products, it can consistently reduce the cost, time, and risk in new product development. In short, well-targeted core products can lead to economies of scale *and* scope.

The Tyranny of the SBU

The new terms of competitive engagement cannot be understood using analytical tools devised to man-

age the diversified corporation of 20 years ago, when competition was primarily domestic (GE versus Westinghouse, General Motors versus Ford) and all the key players were speaking the language of the same business schools and consultancies. Old prescriptions have potentially toxic side effects. The need for new principles is most obvious in companies organized exclusively according to the logic of SBUs. The implications of the two alternate concepts of the corporation are summarized in "Two Concepts of the Corporation: SBU or Core Competence."

Obviously, diversified corporations have a portfolio of products and a portfolio of businesses. But we believe in a view of the company as a portfolio of competencies as well. U.S. companies do not lack the technical resources to build competencies, but their top management often lacks the vision to build them and the administrative means for assembling resources spread across multiple businesses. A shift in commitment will inevitably influence patterns of diversification, skill deployment, resource allocation priorities, and approaches to alliances and outsourcing.

We have described the three different planes on which battles for global leadership are waged: core competence, core products, and end products. A corporation has to know whether it is winning or losing on each plane. By sheer weight of investment, a company might be able to beat its rivals to blue-sky technologies yet still lose the race to build core competence leadership. If a company is winning the race to build core competencies (as opposed to building leadership in a few technologies), it will almost certainly outpace rivals in new business development. If a company is winning the race to capture world manufacturing share in core products, it will probably outpace rivals in improving product features and the price/performance ratio.

Determining whether one is winning or losing end product battles is more difficult because measures of product market share do not necessarily reflect various companies' underlying competitiveness. Indeed, companies that attempt to build market share by relying on the competitiveness of others, rather than investing in core competencies and world core-product leadership, may be treading on quicksand. In the race for global brand dominance, companies like 3M, Black & Decker, Canon, Honda, NEC, and Citicorp have built global brand umbrellas by proliferating products out of their core competencies. This has allowed their individual businesses to build image, customer loyalty, and access to distribution channels.

When you think about this reconceptualization of the corporation, the primacy of the SBU—an organizational dogma for a generation—is now clearly an anachronism. Where the SBU is an article of faith, resistance to the seductions of decentralization can seem heretical. In many companies, the SBU prism means that only one plane of the global competitive battle, the battle to put competitive products on the shelf *today,* is visible to top management. What are the costs of this distortion?

Underinvestment in Developing Core Competencies and Core Products. When the organization is conceived of as a multiplicity of SBUs, no single business may feel responsible for maintaining a viable position in core products nor be able to justify the investment required to build world leadership in some core competence. In the absence of a more comprehensive view imposed by corporate management, SBU managers will tend to underinvest. Recently, companies such as Kodak and Philips have recognized this as a potential problem and have begun searching for new organizational forms that will allow them to develop and manufacture core products for both internal and external customers.

SBU managers have traditionally conceived of competitors in the same way they've seen them-

Two Concepts of the Corporation: SBU or Core Competence

	SBU	Core Competence
Basis for competition	Competitiveness of today's products	Interfirm competition to build competencies
Corporate structure	Portfolio of businesses related in product-market terms	Portfolio of competencies, core products, and businesses
Status of the business unit	Autonomy is sacrosanct; the SBU "owns" all resources other than cash	SBU is a potential reservoir of core competencies
Resource allocation	Discrete businesses are the unit of analysis; capital is allocated business by business	Businesses and competencies are the unit of analysis: top management allocates capital and talent
Value added of top management	Optimizing corporate returns through capital allocation trade-offs among businesses	Enunciating strategic architecture and building competencies to secure the future

selves. On the whole, they've failed to note the emphasis Asian competitors were placing on building leadership in core products or to understand the critical linkage between world manufacturing leadership and the ability to sustain development pace in core competence. They've failed to pursue OEM-supply opportunities or to look across their various product divisions in an attempt to identify opportunities for coordinated initiatives.

Imprisoned Resources. As an SBU evolves, it often develops unique competencies. Typically, the people who embody this competence are seen as the sole property of the business in which they grew up. The manager of another SBU who asks to borrow talented people is likely to get a cold rebuff. SBU managers are not only unwilling to lend their competence carriers but they may actually hide talent to prevent its redeployment in the pursuit of new opportunities. This may be compared to residents of an underdeveloped country hiding most of their cash under their mattresses. The benefits of competencies, like the benefits of the money supply, depend on the velocity of their circulation as well as on the size of the stock the company holds.

Western companies have traditionally had an advantage in the stock of skills they possess. But have they been able to reconfigure them quickly to respond to new opportunities? Canon, NEC, and Honda have had a lesser stock of the people and technologies that compose core competencies but could move them much quicker from one business unit to another. Corporate R&D spending at Canon is not fully indicative of the size of Canon's core competence stock and tells the casual observer nothing about the velocity with which Canon is able to move core competencies to exploit opportunities.

When competencies become imprisoned, the people who carry the competencies do not get assigned to the most exciting opportunities, and their skills begin to atrophy. Only by fully leveraging core competencies can small companies like Canon afford to compete with industry giants like Xerox. How strange that SBU managers, who are perfectly willing to compete for cash in the capital budgeting process, are unwilling to compete for people—the company's most precious asset. We find it ironic that top management devotes so much attention to the capital budgeting process yet typically has no comparable mechanism for allocating the human skills that embody core competencies. Top managers are seldom able to look four or five levels down into the organization, identify the people who embody critical competencies, and move them across organizational boundaries.

Bounded Innovation. If core competencies are not recognized, individual SBUs will pursue only those innovation opportunities that are close at hand—marginal product-line extensions or geographic expansions. Hybrid opportunities like fax machines, laptop computers, hand-held televisions, or portable music keyboards will emerge only when managers take off their SBU blinkers. Remember, Canon appeared to be in the camera business at the time it was preparing to become a world leader in copiers. Conceiving of the corporation in terms of core competencies widens the domain of innovation.

Developing Strategic Architecture

The fragmentation of core competencies becomes inevitable when a diversified company's information systems, patterns of communication, career paths, managerial rewards, and processes of strategy development do not transcend SBU lines. We believe that senior management should spend a significant amount of its time developing a corporatewide strategic architecture that establishes objectives for competence building. A strategic architecture is a road map of the future that identifies which core competencies to build and their constituent technologies.

By providing an impetus for learning from alliances and a focus for internal development efforts, a strategic architecture like NEC's C&C can dramatically reduce the investment needed to secure future market leadership. How can a company make partnerships intelligently without a clear understanding of the core competencies it is trying to build and those it is attempting to prevent from being unintentionally transferred?

Of course, all of this begs the question of what a strategic architecture should look like. The answer will be different for every company. But it is helpful to think again of that tree, of the corporation organized around core products and, ultimately, core competencies. To sink sufficiently strong roots, a company must answer some fundamental questions: How long could we preserve our competitiveness in this business if we did not control this particular core competence? How central is this core competence to perceived customer benefits? What future opportunities would be foreclosed if we were to lose this particular competence?

The architecture provides a logic for product and market diversification, moreover. An SBU manager would be asked: Does the new market opportunity add to the overall goal of becoming the best player in the world? Does it exploit or add to the core competence? At Vickers, for example, diversification options have been judged in the context of becoming the best power and motion control company in the

world (see the insert "Vickers Learns the Value of Strategic Architecture").

The strategic architecture should make resource allocation priorities transparent to the entire organization. It provides a template for allocation decisions by top management. It helps lower level managers understand the logic of allocation priorities and disciplines senior management to maintain consistency.

Vickers Learns the Value of Strategic Architecture

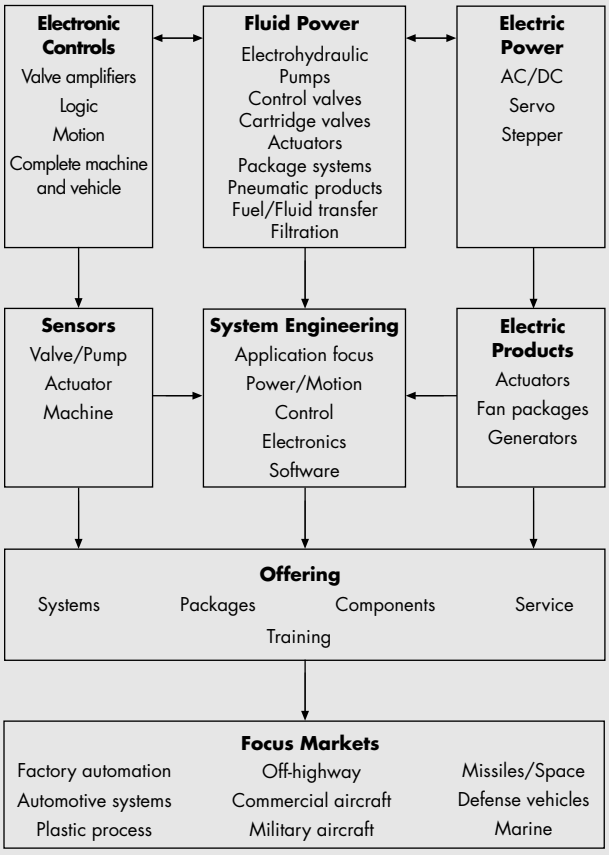
The idea that top management should develop a corporate strategy for acquiring and deploying core competencies is relatively new in most U.S. companies. There are a few exceptions. An early convert was Trinova (previously Libbey Owens Ford), a Toledo-based corporation, which enjoys a worldwide position in power and motion controls and engineered plastics. One of its major divisions is Vickers, a premier supplier of hydraulics components like valves, pumps, actuators, and filtration devices to aerospace, marine, defense, automotive, earth-moving, and industrial markets.

Vickers saw the potential for a transformation of its traditional business with the application of electronics disciplines in combination with its traditional technologies. The goal was "to ensure that change in technology does not displace Vickers from its customers." This, to be sure, was initially a defensive move: Vickers recognized that unless it acquired new skills, it could not protect existing markets or capitalize on new growth opportunities. Managers at Vickers attempted to conceptualize the likely evolution of (a) technologies relevant to the power and motion control business, (b) functionalities that would satisfy emerging customer needs, and (c) new competencies needed to creatively manage the marriage of technology and customer needs.

Despite pressure for short-term earnings, top management looked to a 10- to 15-year time horizon in developing a map of emerging customer needs, changing technologies, and the core competencies that would be necessary to bridge the gap between the two. Its slogan was "Into the 21st Century." (A simplified version of the overall architecture developed is shown here.) Vickers is currently in fluid-power components. The architecture identifies two additional competencies, electric-power components and electronic controls. A systems integration capability that would unite hardware, software, and service was also targeted for development.

The strategic architecture, as illustrated by the Vickers example, is not a forecast of specific products or specific technologies but a broad map of the evolving linkages between customer functionality requirements, potential technologies, and core competencies. It assumes that products and systems cannot be defined with certainty for the future but that preempting competitors in the development of new markets requires an early start to building core competencies. The strategic architecture developed by Vickers, while describing the future in competence terms, also provides the basis for making "here and now" decisions about product priorities, acquisitions, alliances, and recruitment.

Vickers Map of Competencies



Since 1986, Vickers has made more than ten clearly targeted acquisitions, each one focused on a specific component or technology gap identified in the overall architecture. The architecture is also the basis for internal development of new competencies. Vickers has undertaken, in parallel, a reorganization to enable the integration of electronics and electrical capabilities with mechanical-based competencies. We believe that it will take another two to three years before Vickers reaps the total benefits from developing the strategic architecture, communicating it widely to all its employees, customers, and investors, and building administrative systems consistent with the architecture.

In short, it yields a definition of the company and the markets it serves. 3M, Vickers, NEC, Canon, and Honda all qualify on this score. Honda *knew* it was exploiting what it had learned from motorcycles—how to make high-revving, smooth-running, lightweight engines—when it entered the car business. The task of creating a strategic architecture forces the organization to identify and commit to the technical and production linkages across SBUs that will provide a distinct competitive advantage.

It is consistency of resource allocation and the development of an administrative infrastructure appropriate to it that breathes life into a strategic architecture and creates a managerial culture, teamwork, a capacity to change, and a willingness to share resources, to protect proprietary skills, and to think long term. That is also the reason the specific architecture cannot be copied easily or overnight by competitors. Strategic architecture is a tool for communicating with customers and other external constituents. It reveals the broad direction without giving away every step.

Redeploying to Exploit Competencies

If the company's core competencies are its critical resource and if top management must ensure that competence carriers are not held hostage by some particular business, then it follows that SBUs should bid for core competencies in the same way they bid for capital. We've made this point glancingly. It is important enough to consider more deeply.

Once top management (with the help of divisional and SBU managers) has identified overarching competencies, it must ask businesses to identify the projects and people closely connected with them. Corporate officers should direct an audit of the location, number, and quality of the people who embody competence.

This sends an important signal to middle managers: core competencies are *corporate* resources and may be reallocated by corporate management. An individual business doesn't own anybody. SBUs are entitled to the services of individual employees so long as SBU management can demonstrate that the opportunity it is pursuing yields the highest possible pay-off on the investment in their skills. This message is further underlined if each year in the strategic planning or budgeting process, unit managers must justify their hold on the people who carry the company's core competencies.

Elements of Canon's core competence in optics are spread across businesses as diverse as cameras, copiers, and semiconductor lithographic equipment and are shown in "Core Competencies at Canon." When Canon identified an opportunity in digital laser printers, it gave SBU managers the right to raid other SBUs to pull together the required pool of talent. When Canon's reprographics products division undertook to develop microprocessor-controlled copiers, it turned to the photo products group, which had developed the world's first microprocessor-controlled camera.

Also, reward systems that focus only on product-line results and career paths that seldom cross SBU boundaries engender patterns of behavior among unit managers that are destructively competitive. At NEC, divisional managers come together to identify next-generation competencies. Together they decide how much investment needs to be made to build up each future competency and the contribution in capital and staff support that each division will need to make. There is also a sense of equitable exchange. One division may make a disproportionate contribution or may benefit less from the progress made, but such short-term inequalities will balance out over the long term.

Incidentally, the positive contribution of the SBU

Core Competencies at Canon

	Precision Mechanics	Fine Optics	Micro-electronics
Basic camera	■	□	
Compact fashion camera	■	□	
Electronic camera	■	□	
EOS autofocus camera	■	□	■
Video still camera	■	□	■
Laser beam printer	■	□	■
Color video printer	■		■
Bubble jet printer	■		■
Basic fax	■		■
Laser fax	■		■
Calculator			■
Plain paper copier	■	□	■
Battery PPC	■	□	■
Color copier	■	□	■
Laser copier	■	□	■
Color laser copier	■	□	■
NAVI	■	□	■
Still video system	■	□	■
Laser imager	■	□	■
Cell analyzer	■	□	■
Mask aligners	■		■
Stepper aligners	■		■
Excimer laser aligners	■	□	■

Every Canon product is the result of at least one core competency.

manager should be made visible across the company. An SBU manager is unlikely to surrender key people if only the other business (or the general manager of that business who may be a competitor for promotion) is going to benefit from the redeployment. Cooperative SBU managers should be celebrated as team players. Where priorities are clear, transfers are less likely to be seen as idiosyncratic and politically motivated.

Transfers for the sake of building core competence must be recorded and appreciated in the corporate memory. It is reasonable to expect a business that has surrendered core skills on behalf of corporate opportunities in other areas to lose, for a time, some of its competitiveness. If these losses in performance bring immediate censure, SBUs will be unlikely to assent to skills transfers next time.

Finally, there are ways to wean key employees off the idea that they belong in perpetuity to any particular business. Early in their careers, people may be exposed to a variety of businesses through a carefully planned rotation program. At Canon, critical people move regularly between the camera business and the copier business and between the copier business and the professional optical-products business. In midcareer, periodic assignments to cross-divisional project teams may be necessary, both for diffusing core competencies and for loosening the bonds that might tie an individual to one business even when brighter opportunities beckon elsewhere. Those who embody critical core competencies should know that their careers are tracked and guided by corporate human resource professionals. In the early 1980s at Canon, all engineers under 30 were invited to apply for membership on a seven-person committee that was to spend two years plotting Canon's future direction, including its strategic architecture.

Competence carriers should be regularly brought together from across the corporation to trade notes and ideas. The goal is to build a strong feeling of community among these people. To a great extent, their loyalty should be to the integrity of the core competence area they represent and not just to particular businesses. In traveling regularly, talking frequently to customers, and meeting with peers, competence carriers may be encouraged to discover new market opportunities.

Core competencies are the wellspring of new business development. They should constitute the focus for strategy at the corporate level. Managers have to win manufacturing leadership in core products and capture global share through brand-building programs aimed at exploiting economies of scope. Only if the company is conceived of as a hierarchy of core competencies, core products, and market-focused business units will it be fit to fight.

Nor can top management be just another layer of accounting consolidation, which it often is in a regime of radical decentralization. Top management must add value by enunciating the strategic architecture that guides the competence acquisition process. We believe an obsession with competence building will characterize the global winners of the 1990s. With the decade underway, the time for rethinking the concept of the corporation is already overdue.