Ambidextrous Organizations:

Managing Evolutionary and Revolutionary Change

Michael L. Tushman
Charles A. O'Reilly III

All managers face problems in overcoming inertia and implementing innovation and change. But why is this problem such an enduring one? Organizations are filled with sensible people and usually led by smart managers. Why is anything but incremental change often so difficult for the most successful organizations? And why are the patterns of success and failure so prevalent across industries and over time? To remain successful over long periods, managers and organizations must be ambidextrous—able to implement both incremental and revolutionary change.

Patterns in Organization Evolution

Across industries there is a pattern in which success often precedes failure. But industry-level studies aren't very helpful for illustrating what actually went wrong. Why are managers sometimes ineffective in making the transition from strength to strength? To understand this we need to look inside firms and understand the forces impinging on management as they wrestle with managing innovation and change. To do this, let's examine the history of two firms, RCA semiconductors and Seiko watches, as they dealt with the syndrome of success followed by failure.

The stark reality of the challenge of discontinuous change can be seen in Figure 1. This is a listing of the leading semiconductor firms over a forty-year

Some of the ideas contained in this article are elaborated upon in Michael L. Tushman and Charles A. O'Reilly III *Winning Through Innovation: A Practical Guide to Leading Organizational Change and Renewal* (Boston, MA: Harvard Business School Press, 1997).

FIGURE 1. Semiconductor Industry 1955-1995

	1955 (Vacuum Tubes)	1955 (Transistors)	1965 (Semi-conductors)	1975 (Integrated Circuits)	1982 (VLSI)	1995 (Sub-micron)
1.	R.C.A.	Hughes	TI	TI	Motorola	Intel
2.	Sylvania	Transitron	Fairchild	Fairchild	TI	NEC
3.	General Electric	Philco	Motorola	National	NEC	Toshiba
4.	Raytheon	Sylvania	GI	Intel	Hitachi	Hitachi
5.	Westinghouse	TI	GE	Motorola	National	Motorola
6.	Amperex	GE	RCA	Rockwell	Toshiba	Samsung
7.	National Video	RCA	Sprague	GI	Intel	TI
8.	Rawland	Westinghouse	Philco	RCA	Philips	Fujitsu
9.	Eimac	Motorola	Transitron	Philips	Fujitsu	Mitsubishi
10.	Lansdale	Clevite	Raytheon	AMD	Fairchild	Philips

Source: Adapted from R. Foster, *Innovation: The Attacker's Advantage* (New York, NY: Summit Books, 1986).

period. In the mid-1950s, vacuum tubes represented roughly a $700 million market. At this time, the leading firms in the then state-of-the-art technology of vacuum tubes included great technology companies such as RCA, Sylvania, Raytheon, and Westinghouse. Yet between 1955 and 1995, there was almost a complete turnover in industry leadership. With the advent of the transistor, a major technological discontinuity, we see the beginnings of a remarkable shake-out. By 1965, new firms such as Motorola and Texas Instruments had become important players while Sylvania and RCA had begun to fade. Over the next 20 years still other upstart companies like Intel, Toshiba, and Hitachi became the new leaders while Sylvania and RCA exited the product class.

Why should this pattern emerge? Is it that managers and technologists in 1955 in firms like Westinghouse, RCA, and Sylvania didn't understand the technology? This seems implausible. In fact, many vacuum tube producers did enter the transistor market, suggesting that they not only understood the technology, but saw it as important. RCA was initially successful at making the transition. While from the outside it appeared that they had committed themselves to transistors, the inside picture was very different.

Within RCA, there were bitter disputes about whether the company should enter the transistor business and cannibalize their profitable tube business. On one side, there were reasonable arguments that the transistor business was new and the profits uncertain. Others, without knowing whether transistors would be successful, felt that it was too risky not to pursue the new technology. But even if RCA were to enter the solid-state business, there were thorny issues about how to organize it within the company. How could they manage both

technologies? Should the solid-state division report to the head of the electronics group, a person steeped in vacuum tube expertise?

With its great wealth of marketing, financial, and technological resources, RCA decided to enter the business. Historically, it is common for successful firms to experiment with new technologies.[1] Xerox, for example, developed user-interface and software technologies, yet left it to Apple and Microsoft to implement them. Western Union developed the technology for telephony and allowed American Bell (AT&T) to capture the benefits. Almost all relatively wealthy firms can afford to explore new technologies. Like many firms before them, RCA management recognized the problems of trying to play two different technological games but were ultimately unable to resolve them. In the absence of a clear strategy and the cultural differences required to compete in both markets, RCA failed.

In his study of this industry, Richard Foster (then a Director at McKinsey & Company) notes, "Of the 10 leaders in vacuum tubes in 1955 only two were left in 1975. There were three variants of error in these case histories. First is the decision not to invest in the new technology. The second is to invest but picking the wrong technology. The third variant is cultural. Companies failed because of their inability to play two games at once: To be both effective defenders of what quickly became old technologies and effective attackers with new technologies."[2] Senior managers in these firms fell victim to their previous success and their inability to play two games simultaneously. New firms, like Intel and Motorola, were not saddled with this internal conflict and inertia. As they grew, they were able to re-create themselves, while other firms remained trapped.

In contrast to RCA, consider Hattori-Seiko's watch business. While Seiko was the dominant Japanese watch producer in the 1960s, they were a small player in global markets (see Figure 2). Bolstered by an aspiration to be a global leader in the watch business, and informed by internal experimentation between alternative oscillation technologies (quartz, mechanical, and tuning fork), Seiko's senior management team made a bold bet. In the mid-1960s, Seiko transformed itself from being merely a mechanical watch firm into being both a quartz and mechanical watch company. This move into low-cost, high-quality watches triggered wholesale change within Seiko and, in turn, within the world-wide watch industry. As transistors replaced vacuum tubes (to RCA's chagrin), quartz movement watches replaced mechanical watches. Even though the Swiss had invented both the quartz and tuning fork movements, at this juncture in history they moved to reinvest in mechanical movements. As Seiko and other Japanese firms prospered, the Swiss watch

FIGURE 2. Employment in the Swiss Watch Industry, 1955-1985

Year	No. of Firms	No. of Employees
1955	2300	70,000
1965	1900	84,000
1970	1600	89,000
1975	1200	63,000
1980	900	47,000
1985	600	32,000

industry drastically suffered. By 1980, SSIH, the largest Swiss watch firm, was less than half the size of Seiko. Eventually, SSIH and Asuag , the two largest Swiss firms, went bankrupt. It would not be until after these firms were taken over by the Swiss banks and transformed by Nicholas Hayek that the Swiss would move to recapture the watch market.

The real test of leadership, then, is to be able to compete successfully by both increasing the alignment or fit among strategy, structure, culture, and processes, while simultaneously preparing for the inevitable revolutions required by discontinuous environmental change. This requires organizational and management skills to compete in a mature market (where cost, efficiency, and incremental innovation are key) *and* to develop new products and services (where radical innovation, speed, and flexibility are critical). A focus on either one of these skill sets is conceptually easy. Unfortunately, focusing on only one guarantees short-term success but long-term failure. Managers need to be able to do both at the same time, that is, they need to be ambidextrous. Juggling provides a metaphor. A juggler who is very good at manipulating a single ball is not interesting. It is only when the juggler can handle multiple balls at one time that his or her skill is respected.

These short examples are only two illustrations of the pattern by which organizations evolve: periods of incremental change punctuated by discontinuous or revolutionary change. Long-term success is marked by increasing alignment among strategy, structure, people, and culture through incremental or evolutionary change punctuated by discontinuous or revolutionary change that requires the simultaneous shift in strategy, structure, people, and culture. These discontinuous changes are almost always driven either by organizational performance problems or by major shifts in the organization's environment, such as technological or competitive shifts. Where those less successful firms (e.g., SSIH, RCA) react to environmental jolts, those more successful firms proactively initiate innovations that reshape their market (e.g., Seiko).[3]

What's Happening? Understanding Patterns of Organizational Evolution

These patterns in organization evolution are not unique. Almost all successful organizations evolve through relatively long periods of incremental change punctuated by environmental shifts and revolutionary change. These discontinuities may be driven by technology, competitors, regulatory events, or significant changes in economic and political conditions. For example, deregulation in the financial services and airline industries led to waves of mergers and failures as firms scrambled to reorient themselves to the new competitive environment. Major political changes in Eastern Europe and South Africa have had a similar impact. The combination of the European Union and the emergence of global competition in the automobile and electronics industries has shifted the

basis of competition in these markets. Technological change in microprocessors has altered the face of the computer industry.

The sobering fact is that the cliché about the increasing pace of change seems to be true. Sooner or later, discontinuities upset the congruence that has been a part of the organization's success. Unless their competitive environment remains stable—an increasingly unlikely condition in today's world—firms must confront revolutionary change. The underlying cause of this pattern can be found in an unlikely place: evolutionary biology.

Innovation Patterns Over Time

For many years, biological evolutionary theory proposed that the process of adaptation occurred gradually over long time periods. The process was assumed to be one of variation, selection, and retention. Variations occurred naturally within species across generations. Those variations that were most adapted to the environment would, over time, enable a species to survive and reproduce. This form would be selected in that it endured while less adaptable forms reproduced less productively and would diminish over time. For instance, if the world became colder and snowier, animals who were whiter and had heavier coats would be advantaged and more likely to survive. As climatic changes affected vegetation, those species with longer necks or stronger beaks might do better. In this way, variation led to adaptation and fitness, which was subsequently retained across generations. In this early view, the environment changed gradually and species adapted slowly to these changes. There is ample evidence that this view has validity.

But this perspective missed a crucial question: What happened if the environment was characterized, not by gradual change, but periodic discontinuities? What about rapid changes in temperature, or dramatic shifts in the availability of food? Under these conditions, a reliance on gradual change was a one-way ticket to extinction. Instead of slow change, discontinuities required a different version of Darwinian theory—that of punctuated equilibria in which long periods of gradual change were interrupted periodically by massive discontinuities. What then? Under these conditions, survival or selection goes to those species with the characteristics needed to exploit the new environment. Evolution progresses through long periods of incremental change punctuated by brief periods of revolutionary or discontinuous change.

So it seems to be with organizations. An entire subfield of research on organizations has demonstrated many similarities between populations of insects and animals and populations of organizations. This field, known as "organizational ecology," has successfully applied models of population ecology to the study of sets of organizations in areas as diverse as wineries, newspapers, automobiles, biotech companies, and restaurants.[4] The results confirm that populations of organizations are subject to ecological pressures in which they evolve through periods of incremental adaptation punctuated by discontinuities. Variations in organizational strategy and form are more or less suitable for different

environmental conditions. Those organizations and managers who are most able to adapt to a given market or competitive environment will prosper. Over time, the fittest survive—until there is a major discontinuity. At that point, managers of firms are faced with the challenge of reconstituting their organizations to adjust to the new environment. Managers who try to adapt to discontinuities through incremental adjustment are unlikely to succeed. The processes of variation, selection, and retention that winnow the fittest of animal populations seem to apply to organizations as well.

To understand how this dynamic affects organizations, we need to consider two fundamental ideas; how organizations grow and evolve, and how discontinuities affect this process. Armed with this understanding, we can then show how managers can cope with evolutionary and revolutionary change.

Organizational Growth and Evolution

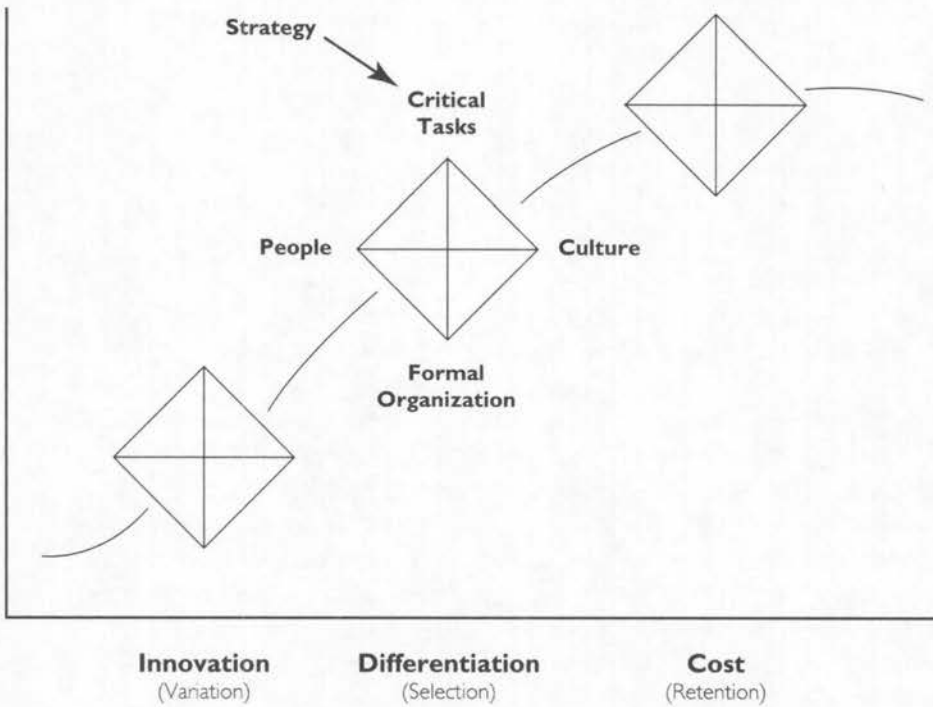
There is a pattern that describes organizational growth. All organizations evolve following the familiar S-curve shown in Figure 3. For instance, consider the history of Apple Computer and how it grew. In its inception, Apple was not so much an organization as a small group of people trying to design, produce, and sell a new product, the personal computer. With success, came the beginnings of a formal organization, assigned roles and responsibilities, some rudimentary systems for accounting and payroll, and a culture based on the shared expectations among employees about innovation, commitment, and speed. Success at this stage was seen in terms of congruence among the strategy, structure, people, and culture. Those who fit the Apple values and subscribed to the cultural norms stayed. Those who found the Jobs and Wozniak vision too cultish left. This early structure was aligned with the strategy and the critical tasks needed to implement it. Success flowed not only from having a new product with desirable features, but also from the ability of the organization to design, manufacture, market, and distribute the new PC. The systems in place tracked those outcomes and processes that were important for the implementation of a single product strategy. Congruence among the elements of the organization is a key to high performance across industries.

As the firm continued its successful growth, several inexorable changes occurred. First, it got larger. As this occurred, more structure and systems were added. Although this trend toward professionalization was resisted by Jobs (who referred to professional managers as "bozos"), the new structures and procedures were required for efficiency and control. Without them, chaos would have reigned. As Apple got older, new norms were developed about what was important and acceptable and what would not be tolerated. The culture changed to reflect the new challenges. Success at Apple and at other firms is based on learning what works and what doesn't.

Inevitably, even Apple's strategy had to change. What used to be a single-product firm (selling the Apple PC and then its successor, the Apple II) now sold a broader range of products in increasingly competitive markets. Instead of a

FIGURE 3. Punctuated Equilibrium and Organizational Evolution

Over time, the fit among business unit strategy, structure, skills, and culture evolve to reflect changing markets and technology. When these changes occur, managers need to realign their units to reflect their new strategic challenges.



focused strategy, the emphasis shifted to a market-wide emphasis. Not only was Apple selling to personal computer users, but also to the educational and industrial markets. This strategic shift required further adjustment to the structure, people, culture, and critical tasks. What worked in a smaller, more focused firm was no longer adequate for the larger, more differentiated Apple. Success at this phase of evolution required management's ability to realign the organization to insure congruence with the strategy. The well-publicized ouster of Steve Jobs by Apple's board of directors reflected the board's judgment that John Sculley had the skills necessary to lead a larger, more diversified company. Jobs's approach was fine for a smaller, more focused firm but inappropriate for the challenges Apple faced in the mid-1980s.

Over an even longer period of success, there are inevitably more changes—sometimes driven by technology, sometimes by competition, customers, or regulation, sometimes by new strategies and ways of competing. As the product class matures, the basis of competition shifts. While in the early

stages of a product class, competition is based on product variation, in the later stages competition shifts to features, efficiency, and cost. In the evolution of Apple, this can be seen as the IBM PC and the clones emerged. The Windows operating system loosened the grip Apple had maintained on the easy-to-use graphical interface and triggered a battle between three incompatible operating systems—the Mac, IBM's OS/2, and Microsoft Windows. Once Windows became the industry standard in operating systems, the basis of competition shifted to cost, quality and efficiency. Faced with these realities, Apple managers once again had to re-balance the congruence among strategy, structure, people, and culture. Success comes from being able to out do the competition in this new environment. So the board of directors replaced Sculley as CEO in 1994 with Michael Spindler, who was seen as having the operational skills needed to run the company in a mature market. Spindler's task was to emphasize the efficiencies and lower margins required in today's markets and reshape Apple to compete in this new market. With Apple's performance stagnant, its board chose a turnaround expert, Gil Amelio, to finish what Spindler could not do.

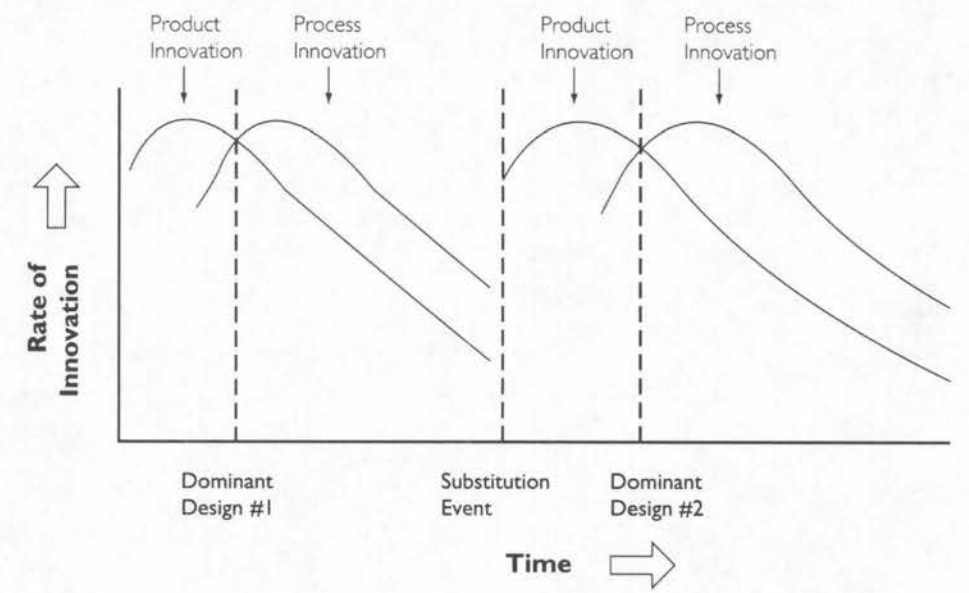
Notice how Apple evolved over a 20-year period. Incremental or evolutionary change was punctuated by discontinuous or revolutionary change as the firm moved through the three stages of growth in the product class; innovation, differentiation, and maturity. Each of these stages required different competencies, strategies, structures, cultures, and leadership skills. These changes are what drives performance. But while absolutely necessary for short-term success, incremental change is not sufficient for long-term success. It is not by chance that Steve Jobs was successful at Apple until the market became more differentiated and demanded the skills of John Sculley. Nor is it surprising that, as the industry consolidated and competition emphasized costs, operations-oriented managers such as Michael Spindler and, in turn, Gil Amelio were selected to reorient Apple.

To succeed over the long haul, firms have to periodically reorient themselves by adopting new strategies and structures that are necessary to accommodate changing environmental conditions. These shifts often occur through discontinuous changes—simultaneous shifts in strategy, structures, skills, and culture. If an environment is stable and changes only gradually, as is the case in industries such as cement, it is possible for an organization to evolve slowly through continuous incremental change. But, many managers have learned (to their stockholders' chagrin) that slow evolutionary change in a fast-changing world is, as it was for the dinosaurs, a path to the boneyard.

Technology Cycles

Although organizational growth by itself can lead to a periodic need for discontinuous change, there is another more fundamental process occurring that results in punctuated change. This is a pervasive phenomenon that occurs across industries and is not widely appreciated by managers. Yet it is critical to understanding when and why revolutionary change is necessary: This is the dynamic

FIGURE 4. Two Invisible Forces: Technology Cycles and Evolution



Adapted from J. Utterback, *Mastering the Dynamics of Innovation* (Boston, MA: Harvard Business School Press, 1994).

of product, service, and process innovation, dominant designs, and substitution events which together make up technology cycles. Figure 4 shows the general outline of this process.[5]

In any product or service class (e.g., microprocessors, automobiles, baby diapers, cash management accounts) there is a common pattern of competition that describes the development of the class over time. As shown in Figure 4, technology cycles begin with a proliferation of innovation in products or services as the new product or service gains acceptance. Think, for example, of the introduction of VCRs. Initially, only a few customers bought them. Over time, as demand increased, there was increasing competition between Beta and VHS. At some point, a design emerged that became the standard preferred by customers (i.e., VHS). Once this occurred, the basis of competition shifted to price and features, not basic product or service design. The emergence of this *dominant design* transforms competition in the product class.[6] Once it is clear that a dominant design has emerged, the basis of competition shifts to process innovation, driving down costs, and adding features. Instead of competing through product or service innovation, successful strategies now emphasize compatibility with the standard and productivity improvement. This competition continues until there is a major new product, service, or process substitution event and the technology cycle kicks off again as the basis of competition shifts back again to product or service variation (e.g., CDs replacing audio tapes). As technology cycles

evolve, bases of competition shift within the market. As organizations change their strategies, they must also realign their organizations to accomplish the new strategic objectives. This usually requires a revolutionary change.

A short illustration from the development of the automobile will help show how dramatic these changes can be for organizations. At the turn of the century, bicycles and horse-driven carriages were threatened by the "horseless carriage," soon to be called the automobile. Early in this new product class there was substantial competition among alternative technologies. For instance, there were several competing alternative energy sources—steam, battery, and internal combustion engines. There were also different steering mechanisms and arrangements for passenger compartments. In a fairly short period of time, however, there emerged a consensus that certain features were to be standard—that is, a dominant design emerged. This consisted of an internal combustion engine, steering wheel on the left (in the U.S.), brake pedal on the right, and clutch on the left (this dominant design was epitomized in the Ford Model T). Once this standard emerged, the basis of competition shifted from variations in what an automobile looked like and how it was powered to features and cost. The new competitive arena emphasized lower prices and differentiated market segments, not product variation. The imperative for managers was to change their strategies and organizations to compete in this market. Those that were unable to manage this transition failed. Similar patterns can be seen in almost all product classes (e.g., computers, telephones, fast foods, retail stores).

With a little imagination, it is easy to feel what the managerial challenges are in this environment. Holding aside the pressures of growth and success, managers must continually readjust their strategies and realign their organizations to reflect the underlying dynamics of technological change in their markets. These changes are not driven by fad or fashion but reflect the imperatives of fundamental change in the technology. This dynamic is a powerful cause of punctuated equilibria and can demand revolutionary rather than incremental change. This pattern occurs across industries as diverse as computers and cement, the only issue is the frequency with which these cycles repeat themselves. Faced with a discontinuity, the option of incremental change is not likely to be viable. The danger is that, facing a discontinuous change, firms that have been successful may suffer from life-threatening inertia—inertia that results from the very congruence that made the firm successful in the first place.

The Success Syndrome: Congruence as a Managerial Trap

Managers, as architects of their organizations, are responsible for designing their units in ways that best fit their strategic challenges. Internal congruence among strategy, structure, culture, and people drives short-term performance.[7] Between 1915 and 1960, General Radio had a strategy of high-quality, high-priced electronic equipment with a loose functional structure,

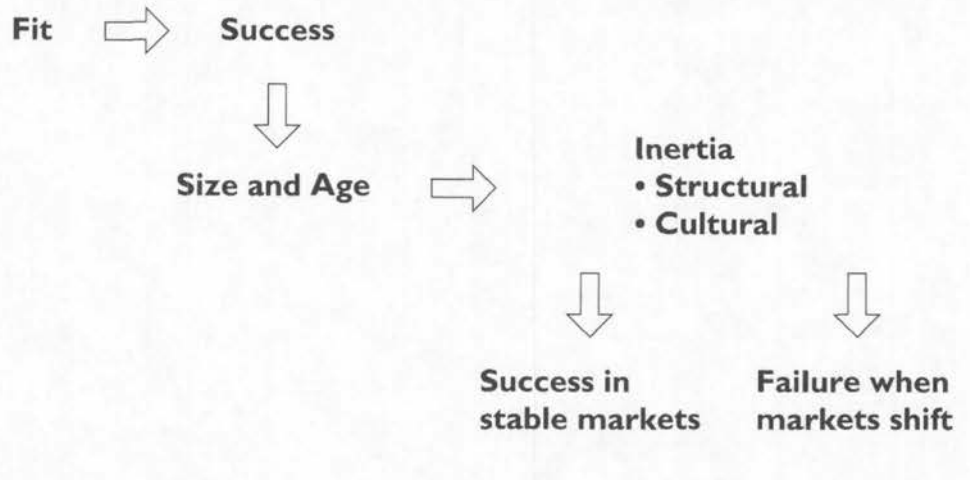
strong internal promotion practices, and engineering dominance in decision making. All these things worked together to provide a highly congruent system and, in turn, a highly successful organization. However, the strategy and organizational congruence that made General Radio a success for 50 years became, in the face of major competitive and technological change, a recipe for failure in the 1960s. It was only after a revolutionary change that included a new strategy and simultaneous shifts in structure, people, and culture that the new company, renamed GenRad, was able to compete again against the likes of Hewlett-Packard and Textronix.[8]

Successful companies learn what works well and incorporate this into their operations. This is what organizational learning is about; using feedback from the market to continually refine the organization to get better and better at accomplishing its mission. A lack of congruence (or internal inconsistency in strategy, structure, culture, and people) is usually associated with a firm's current performance problems. Further, since the fit between strategy, structure, people, and processes is never perfect, achieving congruence is an ongoing process requiring continuous improvement and incremental change. With evolutionary change, managers are able to incrementally alter their organizations. Given that these changes are comparatively small, the incongruence injected by the change is controllable. The process of making incremental changes is well known and the uncertainty created for people affected by such changes is within tolerable limits. The overall system adapts, but it is not transformed.

When done effectively, evolutionary change of this sort is a crucial part of short-term success. But there is a dark side to this success. As we described with Apple, success resulted in the company becoming larger and older. Older, larger firms develop structural and cultural inertia—the organizational equivalent of high cholesterol. Figure 5 shows the paradox of success. As companies grow, they develop structures and systems to handle the increased complexity of the work. These structures and systems are interlinked so that proposed changes become more difficult, more costly, and require more time to implement, especially if they are more than small, incremental modifications. This results in *structural inertia*—a resistance to change rooted in the size, complexity, and interdependence in the organization's structures, systems, procedures, and processes.

Quite different and significantly more pervasive than structural inertia is the *cultural inertia* that comes from age and success. As organizations get older, part of their learning is embedded in the shared expectations about how things are to be done. These are sometimes seen in the informal norms, values, social networks and in myths, stories, and heroes that have evolved over time. The more successful an organization has been, the more institutionalized or ingrained these norms, values, and lessons become. The more institutionalized these norms, values, and stories are, the greater the cultural inertia—the greater the organizational complacency and arrogance. In relatively stable environments, the firm's culture is a critical component of its success. Culture is an effective way of controlling and coordinating people without elaborate and

FIGURE 5. The Success Syndrome



rigid formal control systems. Yet, when confronted with discontinuous change, the very culture that fostered success can quickly become a significant barrier to change. When Lou Gerstner took over as CEO at IBM, he recognized that simply crafting a new strategy was not the solution to IBM's predicament. In his view, "Fixing the culture is the most critical—and the most difficult—part of a corporate transformation."[9] Cultural inertia, because it is so ephemeral and difficult to attack directly, is a key reason managers often fail to successfully introduce revolutionary change—even when they know that it is needed.

The Paradox of Culture

The paradox of culture in helping or hindering companies as they compete can be seen in many ways. Consider, for example, the list of companies shown in Figure 6. These are firms about which there have recently been stories in the business press and in which the culture of the firm was seen as a part of the organization's success or failure. What is notable about this list is its diversity. The importance of organizational culture transcends country, industry, and firm size. Whether they are electronics giant Samsung, a Hong Kong bank, U.S. conglomerate Allied Signal, a high-tech firm such as Applied Materials or a low-tech company such as Nordstrom, or car manufacturers Nissan, Rover, or General Motors, culture appears to be a critical factor in the performance of the company. The language used in describing the importance of culture is often similar. Yukata Kume, President of Nissan, observed: "The most challenging task I faced when I became president five years ago was to reform the corporate culture . . . I decided that the major reason for our suffering or business predicament lay within Nissan itself."[10] Jack Welch at GE commented on the future demands on

FIGURE 6. Firms Recently Mentioned in the Business Press: Culture as a Factor in Success or Difficulty

Hewlett-Packard	British Airways	Federal Express
Oki Electric	Kodak	Sears
Johnson & Johnson	Allied Signal	Deutsche Bank
General Electric	Home Depot	Pepsico
Silicon Graphics	McKinsey	Philips
Motorola	Royal Dutch/Shell	Bausch & Lomb
Levi Strauss	Southwest Airlines	Applied Materials
Microsoft	PPG	General Motors
Samsung	Nike	Wal-Mart
Siemens	Saturn	Boeing
Nordstrom	IBM	Nissan
Procter & Gamble	Tenneco	Rover
Coca Cola	Broken Hill Proprietary	Ford
Lucky-Goldstar	Goldman, Sachs	NUMMI
SBC Warburg	Westinghouse	United Airlines
Apple	Bear Stearns	British Petroleum
Swiss Bank Corp	Rubbermaid	Unilever
Nokia	Matsushita	Salomon
Intel	Chrysler	Rubbermaid
Aetna	Medtronics	Kao

organizations: "In the nineties the heroes, the winners, will be entire companies that have developed cultures that instead of fearing the pace of change, relish it."[11]

While news articles about successes and failures are not proof of anything, they offer an interesting window on the concerns of practicing managers and savvy journalists. Whether the issue is can Nike successfully export its "Just do it" culture to help drive global growth, or can Nokia, a Finnish maker of mobile phones, shed its stodgy culture in time to compete in the fast-moving telecommunications market, the managerial challenges are similar: How can managers diagnose and actively shape organizational cultures to both execute today's strategies and create the capabilities to innovate for tomorrow's competitive demands? To help focus and frame the crucial issue of managing culture, let's reflect on a few examples in which organizational culture helped firms succeed or was a significant part of their problem in adapting to new circumstances.

Here's the Good News

First, consider the remarkable transformation of British Airways. In 1981, British Airways lost almost $1 billion. Their customers often referred to the airline's initials "BA" as standing for "Bloody Awful." Ask any frequent flyer for his or her experiences on BA during this period and horror stories will emerge. Even the employees were embarrassed. One employee acknowledged that "I remember going to parties in the late 1970s, and if you wanted to have a civilized conversation, you didn't actually say that you worked for British Airways, because it got you talking about people's last travel experience, which was usually an unpleasant one."[12] When the announcement was made by the British government that the firm was to be privatized, the *Financial Times* newspaper sniffed that it might be that some investors would buy the stock, but only because "every market has a few masochists."

A scant five years later, however, BA's profits were the highest in the industry, 94 percent of its employees bought stock in 1987 when the firm went public, and passengers were making statements like the following: "I can't tell you how my memory of British Airways as a company and the experience I had 10 years ago contrasts with today. The improvement in service is truly remarkable." What accounts for this turnaround? The answer is largely to be found in the cultural revolution engineered by top management, Lord King, and Sir Colin Marshall.

After deciding that they were in the service business rather than the transportation business, British Airways put virtually it's entire 37,000 person work force through a two-day culture change program entitled "Putting People First." Almost all of the 1400 managers went through a five-day version entitled "Managing People First" (MPF). On the surface this program is not conceptually unique. What separates MPF from most management training sessions is its magnitude, the consistency with which it was applied, and the support of top management. Colin Marshall, the Chief Executive Officer, has called it the "single most important program now in operation" at BA and has addressed almost all of the 64 MPF classes.[13]

The emphasis on the culture change effort at BA was on instilling the new culture, establishing an evaluation scheme that measured not only what managers did but how they did it, and a compensation program with bonuses up to 20 percent based on how managers behave. Managers at BA appreciate that any airline can load passengers on a plane and fly them across the Atlantic. BA understands that they are in the service business and any competitive advantage has to be in the service they offer customers. As Bob Nelson, head of the program noted, "The issue with customer service is that you can train monkeys to smile and make eye-contact, but what the hell do you do when you get a nonstandard requirement?"[14]

With essentially the same work force, flying largely the same routes, and using the same technology, British Airways has become one of the world's

leading airlines. Its competitive advantage is not in strategy or technology but in a culture shared throughout the organization that provides a level of service that competitors have found difficult to imitate. The lesson that we need to explore is how senior managers were successful in managing the culture to provide competitive advantage. What was it that they did that their competitors have been unable to do?

Similar success stories abound. Consider a phenomenon in the retail clothing industry, Nordstrom. While firms like Federated, Macy's, and Carter-Hawley-Hale have wrestled with bankruptcy, Nordstrom has grown from 36 stores and 9,000 employees in 1983 to 76 stores and over 35,000 employees by 1995, with average sales per square foot double the industry average. What accounts for Nordstrom's competitive advantage? A close reading of the strategy literature will quickly suggest that it is not the usual factors such as barriers to entry, power over suppliers and customers, or lack of industry rivalry. The retail industry is quite competitive and buyers and suppliers move easily from one firm to another. It isn't location, merchandise, appearance of the stores, or even the piano in the lobby. Each of these is easily imitable. Rather, as anyone who has shopped Nordstrom knows, it is the remarkable service that Nordstrom provides that differentiates it from its competitors. To deliver this service, Nordstrom relies not on the extensive formal controls manifest in policies, procedures, and close supervision, but rather on its culture, which is characterized by a set of norms and values that provide for a *social* control system. This social control system is used to coordinate activities in the face of the need for change and allows Nordstrom to meet the nonstandard requirements that are the true test of service.

Here's the Bad News

Until now we have told happy stories, ones in which managers have successfully used organizational culture to provide competitive advantage. But there are equally unhappy stories to tell as well; ones in which the culture of the firm is sometimes linked to failure. And, as suggested earlier, the paradox is often that it is the culture associated with the earlier success of the firm that becomes a part of its downfall. Think briefly about two icons of American business success and the difficulties they currently face: IBM and Sears. (While we use IBM and Sears, the phenomenon is world-wide.)

Between 1990 and 1993, IBM lost a total of $14 billion, with an $8.1 billion loss in 1993 alone. How could this happen? Certainly the computer business is a complex one. IBM was and is a very large firm, which complicates the decision-making process. Nevertheless, numerous presumably smart people were employed specifically to anticipate changes and insure that the firm was prepared to meet them. How, then, can we account for this failure, a failure that has cost almost 200,000 people their jobs and shareholders a loss of billions of dollars? It would be wrong to underestimate the complex difficulties in

managing a firm of IBM's size. Certainly the answer must include aspects of strategy, organizational design, technology, and people.

However, perhaps the most important part of the answer to this question, and certainly a part of any solution, is in the culture of IBM; a culture characterized by an inward focus, extensive procedures for resolving issues through consensus and "push back," an arrogance bred by previous success, and a sense of entitlement that guaranteed jobs without a reciprocal *quid pro quo* by some employees. This culture—masquerading under the old IBM basic beliefs in excellence, customer satisfaction, and respect for the individual—was manifest in norms that led to a preoccupation with internal procedures rather than understanding the reality of the changing market. In his letter to the shareholders in the 1993 Annual Report, CEO Lou Gerstner states, "We have been too bureaucratic and too preoccupied with our own view of the world." He sees as one of his toughest and most critical tasks to change this entrenched and patriarchical culture into one characterized by a sense of urgency. Without this shift, he believes IBM will continue to squander its talent and technology.

While occurring in a very different industrial context, a similar drama is playing out at Sears, the great American retailer. Again, the picture is a complicated one and it would be wrong to oversimplify it. The broad outlines of the problem are, however, easily visible. Until 1991, Sears was the largest retailer in the U.S. with over 800 stores and 500,000 employees, including over 6,000 at headquarters in the Sears Tower in Chicago. For decades it was the family department store for America, a place where one could buy everything from clothes to tools to kitchen appliances. However, by the mid-1980s, trouble had begun to surface. Market share had fallen 15 percent from its high in the 70s, the stock price had dropped by 40 percent since Edward Brennan had become CEO in 1985, and chronic high costs hindered Sears from matching the prices of competitors such as Wal-Mart, K-mart, Circuit City, the Home Depot, and other low-cost specialty stores.[15]

Under Brennan's leadership, Sears made a number of strategic changes in attempts to halt the slide. Yet the execution of the strategy was dismal. Observers and analysts attributed the failure to Brennan's inability to revamp the old Sears culture that, as one respected analyst noted, was a "culture is rooted in a long tradition of dominating the retailing industry . . . But this success bred in Sears executives an arrogance and an internal focus that was almost xenophobic." Another observed that "the main problem with Sears is that its managers and executives are 'Sears-ized'—so indoctrinated in the lore of past glories and so entrenched in an overwhelming bureaucracy that they cannot change easily."[16] The old Sears culture, like the old IBM culture, was a product of their success: proud, inward-looking, and resistant to change.

The lesson is a simple one: organizational culture is a key to both short-term success *and*, unless managed correctly, long-term failure. Culture can provide competitive advantage, but as we have seen, it can also create obstacles to the innovation and change necessary to be successful. In the face of significant

changes in technology, regulation, or competition, great managers understand this dynamic and effectively manage *both* the short-term demands for increasing congruence and bolstering today's culture *and* the periodic need to transform their organization and re-create their unit's culture. These organizational transformations involve fundamental shifts in the firm's structure and systems as well as in its culture and competencies. Where change in structure and systems is relatively simple, change in culture is not. The issue of actively managing organization cultures that can handle both incremental and discontinuous change is perhaps the most demanding aspect in the management of strategic innovation and change.

Ambidextrous Organizations: Mastering Evolutionary and Revolutionary Change

The dilemma confronting managers and organizations is clear. In the short run they must constantly increase the fit or alignment of strategy, structure, and culture. This is the world of evolutionary change. But this is not enough for sustained success. In the long-run, managers may be required to destroy the very alignment that has made their organizations successful. For managers, this means operating part of the time in a world characterized by periods of relatively stability and incremental innovation, and part of the time in a world characterized by revolutionary change. These contrasting managerial demands require that managers periodically destroy what has been created in order to reconstruct a new organization better suited for the next wave of competition or technology.[17]

Ambidextrous organizations are needed if the success paradox is to be overcome. The ability to simultaneously pursue both incremental and discontinuous innovation and change results from hosting multiple contradictory structures, processes, and cultures within the same firm. There are good examples of companies and managers who have succeeded in balancing these tensions. To illustrate more concretely how firms can do this, consider three successful ambidextrous organizations, Hewlett-Packard, Johnson & Johnson, and ABB (Asea Brown Boveri). Each of these has been able to compete in mature market segments through incremental innovation and in emerging markets and technologies through discontinuous innovation. Each has been successful at winning by engaging in both evolutionary and revolutionary change.

At one level they are very different companies. HP competes in markets like instruments, computers, and networks. J&J is in consumer products, pharmaceuticals, and professional medical products ranging from sutures to endoscopic surgical equipment. ABB sells power plants, electrical transmission equipment, transportation systems, and environmental controls. Yet each of them has been able to be periodically renew itself and to produce streams of innovation. HP has gone from an instrument company to a minicomputer firm to a personal computer and network company. J&J has moved from consumer

products to pharmaceuticals. ABB transformed itself from a slow heavy engineering company based primarily in Sweden and Switzerland to an aggressive global competitor with major investments in Eastern Europe and the Far East. In spite of their differences, each has been ambidextrous in similar ways.

Organizational Architectures

Although the combined size of these three companies represents over 350,000 employees, each has found a common way to remain small by emphasizing autonomous groups. For instance, J&J has over 165 separate operating companies that scramble relentlessly for new products and markets. ABB relies on over 5,000 profit centers with an average of 50 people in each. These centers operate like small businesses. HP has over 50 separate divisions and a policy of splitting divisions whenever a unit gets larger than a thousand or so people. The logic in these organizations is to keep units small and autonomous so that employees feel a sense of ownership and are responsible for their own results. This encourages a culture of autonomy and risk taking that could not exist in a large, centralized organization. In the words of Ralph Larsen, CEO of J&J, this approach "provides a sense of ownership and responsibility for a business you simply cannot get any other way."[18]

But the reliance on small, autonomous units are not gained at the expense of firm size or speed in execution. These companies also retain the benefits of size, especially in marketing and manufacturing. ABB continually reevaluates where it locates its worldwide manufacturing sites. J&J uses its brand name and marketing might to leverage new products and technologies. HP uses its relationships with retailers developed from its printer business to market and distribute its new personal computer line. But these firms accomplish this without the top-heavy staffs found at other firms. Barnevik reduced ABB's hierarchy to four levels and a headquarters staff of 150 and purposely keeps the structure fluid. At J&J headquarters, there are roughly a thousand people, but no strategic planning is done by corporate. The role of the center is to set the vision and review the performance of the 165 operating companies. At HP, the former CEO, John Young, recognized in the early 1990s that the more centralized structure that HP had adopted in the 1980s to coordinate their minicomputer business had resulted in a suffocating bureaucracy that was no longer appropriate. He wiped it out, flattening the hierarchy and dramatically reducing the role of the center.

In these companies, size is used to leverage economies of scale and scope, not to become a checker and controller that slows the organization down. The focus is on keeping decisions as close to the customer or the technology as possible. The role of headquarters is to facilitate operations and make them go faster and better. Staff have only the expertise that the field wants and needs. Reward systems are designed to be appropriate to the nature of the business unit and emphasize results and risk taking. Barnevik characterizes this as his 7-3 formula; better to make decisions quickly and be right seven out of ten times than waste

time trying to find a perfect solution. At J&J this is expressed as a tolerance for certain types of failure; a tolerance that extends to congratulating managers who take informed risks, even if they fail. There is a delicate balance among size, autonomy, teamwork, and speed which these ambidextrous organizations are able to engineer. An important part of the solution is massive decentralization of decision making, but with consistency attained through individual accountability, information sharing, and strong financial control. But why doesn't this result in fragmentation and a loss of synergy? The answer is found in the use of social control.

Multiple Cultures

A second commonality across these firms is their reliance on strong social controls.[19] They are simultaneously tight and loose. They are tight in that the corporate culture in each is broadly shared and emphasizes norms critical for innovation such as openness, autonomy, initiative, and risk taking. The culture is loose in that the manner in which these common values are expressed varies according to the type of innovation required. At HP, managers value the openness and consensus needed to develop new technologies. Yet, when implementation is critical, managers recognize that this consensus can be fatal. One senior manager in charge of bringing out a new work station prominently posted a sign saying, "This is not a democracy." At J&J, the emphasis on autonomy allows managers to routinely go against the wishes of senior management, sometimes with big successes and sometimes with failures. Yet, in the changing hospital supply sector of their business, managers recognized that the cherished J&J autonomy was stopping these companies from coordinating the service demanded by their hospital customers. So, in this part of J&J, a decision was made to take away some of the autonomy and centralize services. CEO Larsen refers to this as J&J companies having common standards but unique personalities.

A common overall culture is the glue that holds these companies together. The key in these firms is a reliance on a strong, widely shared corporate culture to promote integration across the company and to encourage identification and sharing of information and resources—something that would never occur without shared values. The culture also provides consistency and promotes trust and predictability. Whether it is the Credo at J&J, the HP Way, or ABB's Policy Bible, these norms and values provide the glue that keeps these organizations together. Yet, at the same time, individual units entertain widely varying subcultures appropriate to their particular businesses. For example, although the HP Way is visible in all HP units worldwide, there are distinct differences between the new video server unit and an old line instrument division. What constitutes risk taking at a mature division is different than the risk taking emphasized at a unit struggling with a brand new technology. At J&J, the Credo's emphasis on customers and employees can be seen as easily in the Philippines as in corporate headquarters in New Brunswick, New Jersey. But

the operating culture in the Tylenol division is distinctly more conservative than the culture in a new medical products company.

This tight-loose aspect of the culture is crucial for ambidextrous organizations. It is supported by a common vision and by supportive leaders who both encourage the culture and know enough to allow appropriate variations to occur across business units. These companies promote both local autonomy and risk taking and ensure local responsibility and accountability through strong, consistent financial control systems. Managers aren't second-guessed by headquarters. Strategy flows from the bottom up. Thus, at HP the $7 billion printer business emerged not because of strategic foresight and planning at HP's headquarters, but rather due to the entrepreneurial flair of a small group of managers who had the freedom to pursue what was believed to be a small market. The same approach allows J&J and ABB to enter small niche markets or develop unproven technologies without the burdens of a centralized bureaucratic control system. On the other hand, in return for the autonomy they are granted, there are strong expectations of performance. Managers who don't deliver are replaced.

Ambidextrous Managers

Managing units that pursue widely different strategies and that have varied structures and cultures is a juggling act not all managers are comfortable with. At ABB, this role is described as "preaching and persuading." At HP, managers are low-key, modest, team players who have learned how to manage this tension over their long tenures with the company. At HP, they also lead by persuasion. "As CEO my job is to encourage people to work together, to experiment, to try things, but I can't order them to do it," says Lew Platt.[20] Larsen at J&J echoes this theme, emphasizing the need for lower level managers to come up with solutions and encouraging reasonable failures. Larsen claims that the role is one of a symphony conductor rather than a general.

One of the explanations for this special ability is the relatively long tenure managers have in these organizations and the continual reinforcement of the social control system. Often, these leaders are low-keyed but embody the culture and act as visible symbols of it. As a group the senior team continually reinforces the core values of autonomy, teamwork, initiative, accountability, and innovation. They ensure that the organization avoids becoming arrogant and remains willing to learn from its competitors. Observers of all three of these companies have commented on their modesty or humility in constantly striving to renew themselves. Rather than becoming complacent, these organizations are guided by leaders who venerate the past but are willing to change continuously to meet the future.

The bottom-line is that ambidextrous organizations learn by the same mechanism that sometimes kills successful firms: variation, selection, and retention. They promote variation through strong efforts to decentralize, to eliminate bureaucracy, to encourage individual autonomy and accountability, and to experiment and take risks. This promotes wide variations in products,

technologies, and markets. It is what allows the managers of an old HP instrument division to push their technology and establish a new division dedicated to video servers. These firms also select "winners" in markets and technologies by staying close to their customers, by being quick to respond to market signals, and by having clear mechanisms to "kill" products and projects. This selection process allowed the development of computer printers at HP to move from a venture that was begun without formal approval to the point where it now accounts for almost 40% of HP's profits. Finally, technologies, products, markets, and even senior managers are retained by the market, not by a remote, inwardly focused central staff many hierarchical levels removed from real customers. The corporate vision provides the compass by which senior managers can make decisions about which of the many alternative businesses and technologies to invest in, but the market is the ultimate arbiter of the winners and losers. Just as success or failure in the marketplace is Darwinian, so too is the method by which ambidextrous organizations learn. They have figured out how to harness this power within their companies and organize and manage accordingly.

Summary

Managers must be prepared to cannibalize their own business at times of industry transitions. While this is easy in concept, these organizational transitions are quite difficult in practice. Success brings with it inertia and dynamic conservatism. Four hundred years ago, Niccolo Machiavelli noted, "There is no more delicate matter to take in hand, nor more dangerous to conduct, nor more doubtful in its success, than to be a leader in the introduction of changes. For he who innovates will have for enemies all those who are well off under the old order of things, and only lukewarm supporters in those who might be better off under the new."[21]

While there are clear benefits to proactive change, only a small minority of farsighted firms initiate discontinuous change before a performance decline. Part of this stems from the risks of proactive change. One reason for RCA's failure to compete in the solid-state market or for SSIH's inability to compete in quartz movements came from the divisive internal disputes over the risks of sacrificing a certain revenue stream from vacuum tubes and mechanical watches for the uncertain profits from transistors and quartz watches. However, great managers are willing to take this step. Andy Grove of Intel puts it succinctly, "There is at least one point in the history of any company when you have to change dramatically to rise to the next performance level. Miss the moment and you start to decline."[22]

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