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The Economic Environment which Gave Rise to High-Speed Management

Being a successful business executive in the 1990s will be very difficult and require a new management orientation. Rapidly changing technologies, the globalization of economic forces, unexpected competition, and quick market saturation are creating an increasingly complex and volatile business climate. As environmental turbulence increases, the rate of organizational change necessary for survival also increases. To compete successfully in such an environment requires that executives employ new management assumptions and practices which emphasize organizational innovation, flexibility, efficiency, and speed of response.

To build such an organizational capability, management must reframe and sharpen their information and communication capabilities. In the final analysis, it is the innovative, adaptable, flexible, efficient and rapid use of information and communication which allows an organization to reorient rapidly and successfully in a volatile business environment. The information and communication principles, strategies, and techniques which underlie such an organizational capability are termed high-speed management and their explication, illustration, and evaluation are the subject matter of this book.
(King and Cushman, 1993:1)

Regardless of which corporation or corporations, which nation or nations emerge as leaders in the high-technology race, the world high-technology market has given rise to a new system of management which is revolutionizing the way work gets done in all other markets.

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This new *high-speed management system* is a set of information and communication principles, strategies, and tools for coming up with a steady flow of new products, making sure they are what the customer wants, designing and manufacturing them with speed and precision, getting them to the market quickly, and servicing them easily in order to make large profits and satisfy consumer needs. This high-speed management system has been the primary source of *sustainable competitive advantage* first for high-technology and now for other types of firms participating in the emerging global economy.

Fortune magazine each year surveys the CEOs of the two thousand largest U.S. corporations along with selected members of the investment community in order to determine which American corporations have the most admired management teams. For ten successive years the top-ranked management team has come from the high-technology sector. More importantly, at least three and sometimes as many as nine of the top ten management teams have been from high-technology firms (Makin, 1983; Sellers, 1985; Baig, 1987; Scheen, 1988; Davenport, 1989; Smith, 1990; Sprout, 1991; Ballen, 1992; Reese, 1993; Fornham, 1994). *Any attempt to assess excellence in corporate management throughout the world in the last decade would have to give a prominent place to the performance of high-technology firms and to the role high-speed management systems play in generating that performance.*

High-speed management, which began in the high-technology sector, is now diffusing to all sectors of the world economy with promising results. High-speed management is based upon the revolution taking place in information and communication technology and on the emerging global economy. What is high-speed management? Why is it based on the revolution in information and communication technology? What role does the emerging global economy play in this process? How has high-speed management revolutionized organizational information and communication systems? The answers to these and other questions are the subject of this book.

Prior to entering into the main body of our analysis, we shall explore four trends which are restructuring the global economic environment, placing new demands on corporate management, and which gave rise to high-speed management systems. We will then be in a position in chapter 2 to overview the role information and communication principles, strategies, and tools will play in high-speed management and the structure their exploration will take in the remaining chapters of the book.

We have, as Manuel Castells (1986:297) points out, "the privilege and responsibility of living through one of the greatest techno-

logical revolutions in the history of humankind." This revolution is rooted in the convergence of four trends.

First, a series of technological breakthroughs have taken place which make possible the generation, processing, and instant delivery of information and communication throughout the world, creating a revolution in organizational manufacturing, marketing, and management.

Second, this revolution is restructuring international and national economies in favor of regions with a large core market, a strong scientific and technological workforce, and a private economic sector which can attract capital in order to provide the infrastructure necessary for increased growth and rapid technological change.

Third, this information and communication revolution and the economic restructuring it induces create a business climate characterized by rapidly changing technology, quick market saturation, and unexpected competition, making succeeding in business very difficult.

Fourth, to compete successfully in such an environment requires that executives employ management assumptions and practices that emphasize organizational change—assumptions and practices that are innovative, adaptive, flexible, efficient, and rapid in response.

The convergence of these four trends has led to the emergence of high-speed management—a set of information and communication principles, strategies, and techniques for responding to rapid change in a turbulent global economic environment.

The Revolution in Information and Communication Technologies

It is hard to overestimate the strategic significance of the new information technology. This technology is transforming the nature of products, processes, companies, industries, and even competition itself. Until recently most managers treated information technology as a support service and delegated it to EDP departments. Now, however, every company must understand the broad effects and implications of the new technology and how it can create substantial and sustainable competitive advantage.

(Porter and Miller, 1985:149)

The information and communications revolution began in the 1950s and has proceeded to change every aspect of corporate life. At the center of this revolution is a constellation of new management tools based on *computers* and *telecommunications* and classified as *new manufacturing, marketing, and management technologies*. Taken

collectively, these tools provide a new way of thinking and acting in regard to all the problems that confront management in dealing with a rapidly changing economic environment. Let us briefly examine each in turn.

Computer technologies allow managers to store, search, analyze, and evaluate massive amounts of information at increasing rates of speed and accuracy, making a greater quantity and quality of knowledge available to expert and nonexpert workers. Computer technologies continue to advance. Intel Corp.'s new 80486 microprocessor—"a kind of chip that acts as a computer brain—makes it possible for desk top computers to scan *The Encyclopedia Britannica*—its 29 volumes of 29,000 plus pages—and pluck out a single bit of information you want in just two seconds" (Rebello, 1988:B1). America's Digital Equipment Corp. has developed the Alpha chip. This chip has the same peak performance capability as a Cray-1 system—a small supercomputer. An Alpha chip will run at a clock speed of 200 megahertz and deliver peak power of 400 MIPS, or a million instructions per second (Wilke, 1992). This chip will once again revolutionize computing by allowing portable computers to have the capabilities formerly reserved for supercomputers to store 16 million pieces of information per memory chip and to process that information at breathtaking speeds. *Computers are thus creating decentralized and diversified information processing power.*

Telecommunication technologies combine the power of computers with the power of the telephone, fiber optic, microwave, satellite, or broadcast networks in order to deliver information instantly anywhere on the globe. Such technologies also allow management to access 6,245 major databases and 822 information services and to interact via audio, voice, or print with experts and coworkers in major population centers throughout the world (*Directory of On Line Data Bases*, 1992). Telecommunication technologies allow corporations who have facilities and customers throughout the world to tie their services together into interactive networks. Through telecommunications, investors can gain access to the New York, London, and Tokyo stock exchanges, creating twenty-four-hour access to stock markets. Large international banks such as Fuji, Citicorp, and Deutsche Bank can transfer assets to and from subsidiaries twenty-four hours a day throughout the world (Bartmess and Cerry, 1993). Telecommunication interconnects at decreasing cost and with increasing speed and carrying capacity all human and mechanical information systems. *Telecommunication thus allows for greater*

integration, coordination, and control of organizational activities throughout the world, creating network power (Young, 1990).

New manufacturing technologies employ computer-aided and telecommunication-linked engineering, manufacturing, and resource-planning processes to create a sustainable competitive advantage. New manufacturing technologies allow for the development, production, sales, and service of customized new products at low cost, high quality, and easy service throughout the world. Allen-Bradley, a Milwaukee manufacturer of industrial controls, opened one of the world's most modern computer-aided and telecommunication-linked manufacturing facilities. This facility can produce one of a product or 100,000 of the product at the same per unit cost. This plant can receive the specifications for an order one day and deliver the product at its destination the next, cutting the average turnaround time on orders from four weeks to two days. Manufacturing costs decreased by 40 percent while profits increased by 32 percent and product quality control by 200 percent (Port, 1986:100–108). *New manufacturing technologies employ computer-aided and telecommunication-linked manufacturing processes in order to create competitive advantage* (Young, 1990).

New marketing information technologies employ computer-aided and telecommunication-linked environmental scanning, electronic test marketing, and real-time merchandising for speed in providing customers with world-class products when and where they want them in order to increase market shares. Campbell Soup Company, for example, can scan the environment to determine the need for a new soup; model its contents; simulate its production; calibrate its cost, price, profit, and sales potential; develop an artificial intelligence system to control the rate and quality of production; pretest its name, taste, shelf placement, and the type and content of its advertising; and determine its test markets—reducing a management decision process which used to take years to a matter of days. Management information technologies cut the cost of this process by 30 percent while increasing product success rates by 80 percent (Russell, Adams, and Boundy, 1986). *New marketing information technologies allow for the delivery of world-class products which meet customers' needs and delivery when and where customers want them, thereby creating increased market shares* (Young, 1990).

New management information technologies employ computer-aided and telecommunication-linked decision support, operational research, artificial intelligence, and group technology systems to

integrate, coordinate, and control management processes in order to create competitive advantage. American Express recently implemented an artificial intelligence system which provides decision support for managers making authorization decisions on individual purchases from 400,000 shops and restaurants throughout the world. This expert system reduced by 20 percent the turnaround time per transaction and reduced by 50 percent the number of authorizations in trouble ninety days later, while providing annual savings of \$27 million (Feigenbaum, McCorduck, and Nii, 1988). *New management information technologies allow for more effective integration, coordination, and control of all organizational processes, creating competitive advantage* (Young, 1990).

These then are the new information and communication tools which, when taken collectively, are creating a new way of thinking and acting in regard to all management problems, creating the need for a new high-speed management system.

The Restructuring of the International Economy

Despite occasional setbacks, the world is moving towards global markets. The number of industries that are globalizing and the pace at which they are doing so is accelerating. This can only mean a continuing series of strategic and organizational readjustments for corporations who compete in these businesses. In the future the reward for each success will be the opportunity to make more changes.

(Gluck, 1983:15)

Driven by significant advances in information and communication technology, the global economy is currently undergoing rapid change. New market forces are emerging as the world's economic center of gravity continues moving westward toward the Orient. The economies of most nations are becoming more open to international influence and their relative economic importance is shifting in favor of regions with large core markets, a strong scientific and technological base, and a private economic sector which can attract capital to fuel the change. In order to understand why this economic restructuring is taking place, we must: (a) explore the economic trends of the past four decades, (b) examine how the high-technology revolution intersects these trends, and (c) explore the changes this intersection is creating in the international economy.

Economic Trends of the Past Decade

The international economy is facing an extended period of rapid change, driven at one end by the newly emerging information and communication technologies and at the other end by the rise of powerful multinational corporations throughout the world. Four trends effectively characterize these changes: a rapid increase in international trade, the emergence of regional core markets, the emergence of a single model of economic development, and a shift in global economic power towards the nations located on the Pacific Rim.

First, driven by information and communication technologies and the comparative advantage they create, world trade over the past four decades has grown much faster than the world's gross national product. International exports and imports were about one-fifth the world gross national product (GNP) in 1962, one-fourth in 1972, one-third in 1982, and are projected to approach one-half the world GNP by 1993 (*Wall Street Journal*, 1992:A10).

Second, this internationalization of world trade is leading to the emergence of three regional core markets. In 1994 the United States, Canada, and Mexico signed the North American Free Trade Agreement aimed at lowering trade barriers over ten years between the three nations forming a regional core market of 275 million people, with a GNP of \$4.7 trillion and 21.5 percent of world trade (*The Economist*, 1994). By 1992, the *European Economic Community* (EEC), consisting of twelve nations—West Germany, France, Italy, Belgium, Luxembourg, the Netherlands, Britain, Ireland, Denmark, Greece, Portugal, and Spain—began to lower trade barriers between these nations, creating a regional core market of 320 million people, a GNP of \$4.1 trillion, and 21.5 percent of world trade (Hillkirk, 1989:4B). In addition, twelve other European nations have applied for admission to the European Economic Community. By early 1992, Japan had taken steps to unify the Asian development corridor consisting of Japan, South Korea, Thailand, Malaysia, Indonesia, and the Philippines into a regional core market of 1 billion people with a GNP of \$6 trillion and 38 percent of world trade (Pura, 1992).

Third, over the past decade a single model of economic development has emerged which is influencing economic policies throughout the nations involved in the emerging global economy. As Castells (1986:300) argues:

Such a model is not necessarily linked to a particular political party or administration, or even to a country, even though the Reagan or Thatcher governments seem to be the closest examples

of the fulfillment of these policies. But very similar policies have developed in most West European countries, in those governed by Socialists, and even in Communist-led regions (Italy) or Communist-participating governments (France, for a certain period). At the same time, in most Third World countries, austerity policies, inspired or dictated by the International Monetary Fund and world financial institutions, have also developed along the same lines, establishing not without contradictions and conflicts (Walton, 1985) a new economic logic that is not only capitalistic but a very specific kind of capitalism.

The generalization of such a model does not imply all governments nor all economies are alike; it merely suggests broad central tendencies in the economic policies of most nations as they begin to participate in the global economy. This model includes seven general features:

1. Control of inflation through fiscal austerity and monetary restrictions
2. Reduction of labor costs as percentage of product cost
3. Increased productivity and profitability through use of information technology
4. Restructuring of industrial and service sectors by disinvesting from low-profit areas and investing in high-growth, high-profit areas
5. Privatization and deregulation of the economy by withdrawing from state ownership and control in favor of open market forces
6. Relative control over the pricing of raw materials and energy, assuring the stability of pricing systems and exchange flows
7. Opening up to world markets and increased internationalization of economies

This general model for effective participation in the global economy arose during the 1970s and 1980s just as the information technology revolution was getting underway, encouraging the growth of multinational corporations and the participation of nation states in the world marketplace. Recently signs are surfacing that even such bastions of socialism as the former nations of the USSR, China, and the countries in Eastern Europe are positioning their economies via this model for entry into the global economic arena.

Fourth, by the late 1980s the economic center of gravity for the global economy began to shift away from the United States and the EEC toward the nations of the Pacific Rim. Japan, Australia, New Zealand, Hong Kong, Singapore, Taiwan, South Korea, Thailand, Malaysia, China, India, the Philippines, Indonesia, Canada, Latin America, and the United States accounted for a higher share of world trade (38 percent) than the countries of Western Europe (21.5 percent). U.S. trade with the nations of the Pacific Rim had by 1981 exceeded its trade with Europe and is estimated to double that of Europe by the early 1990s. The Pacific Rim nations represent a potential regional core market of 3 billion people and represent a \$9 trillion-a-year market growing at a rate of \$3 billion a week (Facts on the Pacific, 1992).

In addition, table 1.1 reveals a similar shift over the past four decades in the world's largest 100 industrial corporations, with the U.S. total declining from 70 to 33, Western Europe's growing from 28 to 41, and the Pacific Rim nations' increasing from 2 to 19. Japan has 16 such companies and South Korea 2. Whether the Pacific Rim nations become a regional core market or not, we are witnessing the attempt by the major trading nations of the world—the United States, West Germany, and Japan—to develop regionalized core markets in which their national products receive preferential treatment. At the same time, the world's multinational corporations are attempting to establish major subsidiaries in each of these core markets, guaranteeing them a global base of economic power.

While the restructuring of the global economy has led to (1) a rapid increase in world trade, (2) the emergence of two regional core markets, and (3) a shift in the center of economic gravity towards the nations of the Pacific Rim, *each change has in turn increased the demand for more effective organizational information and communication systems.* Organizations seek new information and communication systems capable of more quickly integrating, coordinating, and controlling a firm's global activities in response to this restructuring of the global economy.

How High-Technology Intersects These Economic Trends

The *maturing* of the information technology revolution at the beginning of the 1990s is both furthering and significantly modifying these 1980s economic trends. Let us explore how this maturation intersects (a) the global economy and (b) national economies.

First, information technology and increased trade are leading to a realignment of the global economy in several areas. The integra-

Table 1.1 WORLD'S LARGEST 100 INDUSTRIALS

AREA	1960	1970	1980	1990
United States	70	64	45	33
Western Europe	28	27	42	41
Pacific Rim	2	9	11	19
Other	0	0	3	7

(Compiled from "The International 500," published annually by *Fortune*, August 1961, 1971, 1981, 1991.)

tion, coordination, and control provided by new information and communication technologies are redefining organizational costs to a point at which comparative advantage is best achieved by locating both production and marketing facilities in these core markets (Dent, 1990; Cohen and Zysman, 1984). This is encouraging both multinationals and small and medium size corporations from the less developed countries to move production facilities to core market areas. *The threat of unemployment in the depressed regions of the United States, Europe, and the Pacific Rim has motivated a new policy of economic incentives by governments, encouraging an interregional rather than an international division of labor* (Rapoport, 1992; Dent, 1990). This is further accelerating the return of production facilities to core market areas.

National and regional governments in the core market areas are beginning to limit or halt market access for multinationals who do not adhere to pricing standards, production quotas, or patent rights. Multinationals are meeting this challenge by relocating in core markets where they conform to or receive preferential legislative exclusion from such governmental actions (Rapoport, 1992; Dumaine, 1990). *National and regional governments are seeking to create favorable conditions for economic expansion within core markets by maintaining low inflation, reasonable wages, access to a highly skilled labor force, low interest, investment capital, and a favorable rate of exchange between its currencies and others in core markets throughout the world* (Cushman and King, 1989).

Second, three factors favor national economic success in the 1990s: the size of domestic markets, technological capabilities, and ability to attract capital to provide the infrastructure for increased technological change. How then do these factors influence the international division of labor emerging in the 1990s?

The group of countries located in core markets with large scientific and technological bases and a private sector with the ability to attract capital includes the United States, Canada, Mexico, Japan, and the countries of the European Economic Community. These countries will experience steady economic growth with a rebirth of production facilities within their boundaries. Further advances in information technology and an increased diffusion of existing technology will substantially increase the quality of life of their citizens.

The group of countries consisting of Australia and the nonmembers of the EEC located in Western Europe have small populations, modest scientific and technical bases, and modest capital accumulation potential. The fortunes of these countries will be tied closely to the core market areas they service. Their growth will be erratic as they benefit from upswings in the core markets but suffer unduly from downswings. Such swings will significantly slow the rate of diffusion of information technology and the corresponding increase in the quality of life they offer.

The group of countries including the newly industrialized nations of South Korea, Taiwan, Hong Kong, Thailand, Malaysia, and Singapore have medium size population bases which collectively could become a new core market, a modest and increasing scientific and technological base, and governments which are capable of significant capital accumulation. These nations will become tied more and more to the core markets they service, with some production shifting offshore, automation at home, and a growing need to invest heavily in upgrading their labor force. Further advances in information and communication technology and the diffusion of existing technology will increase the quality of life of most countries.

The group of countries consisting of the People's Republic of China, India, and Indonesia have very large populations with very low average incomes. For these countries, as their average income rises, they can absorb the world's products and each become a large core market in and of itself, or they can join nearby nations in creating a new Asian core market. If the governments of these countries remain stable, they also may attract outside investment in return for market access. However, it is unlikely that these countries will create an educated and well-trained labor force in the near future, given the size of their current labor force. Further, advances and increases in the acquisition of information and communication technology will increase the quality of life in each of these countries.

The group of countries including Brazil and the nations of the former USSR and Eastern Europe will find the information revolution

a mixed blessing as they seek to dramatically upgrade the motivation and quality of their workforce, while experiencing a growing demand by their citizens for capital goods, with insufficient resources to provide for both economic growth and consumer demand. Each of these areas has the potential, if it can maintain political stability, control inflation, and achieve consistent economic growth, to become a core market. All have a growing scientific and technological base. However, Brazil, the former nations of the USSR, and most of the countries of Eastern Europe are huge debtor nations and have only begun the process of moving from a central planned to a market economy. Effective leadership will be the key to their emergence as full participants in the world economy.

*The major oil producing countries—Iran, Iraq, Saudi Arabia, Venezuela, and Nigeria—*have access to sufficient capital accumulation to begin modernization but lack the scientific and technological base and population base to become a core market. In addition, internal and external political forces are at work creating instability in the form of religious and nonreligious wars in the Middle East, weak political institutions and ethnic cleavages in Nigeria and Indonesia, and weak economies due to large national debts in Venezuela and Nigeria. This suggests that the information revolution will bypass the general population but may intersect certain economic sectors—namely, the military and the elite.

Finally, most of the Third World countries will be bypassed and denied access to the emerging global economy. Some countries, such as *Sri Lanka, Mozambique, Nicaragua, and Peru*, will try to maintain their national integrity by meeting the needs of their countries with domestic production and thus avoid the global economic imperatives of the information and communication revolution. It seems unlikely that such a strategy can isolate these countries from participation in the information and communication revolution and the emerging global economy it is creating.

These then are the economic imperatives which are constraining various nations' differential participation in the information revolution and the emerging global economy.

The Emergence of a New Business Climate

Rapidly changing technology, quick market saturation, unexpected global competition—these all make succeeding in business, particularly a high technology business, harder than ever today.

(Fraker, 1984:66)

The volatile business climate engendered by the information technology revolution and the globalization of economic forces has led to a significant realignment of national economic resources. The emergence of a volatile business climate also has significant implications for the realignment of individual corporations' economic resources. In order to understand this corporate realignment we will (1) explore the unique problem this realignment creates for individual corporations, (2) outline the new corporate perspective for responding to this problem, and (3) examine the new management assumptions that are necessary to compete successfully in a volatile business climate.

The Problem of a Shrinking Product Life Cycle

Most of these environmental forces precipitating the need for rapid change in corporate operations arise from a single problem—namely, the fact that firms are confronted by shrinking product life cycles. The product life cycle is the period of time from the inception of an idea for a product until the market for that product is saturated or disappears due to new product development. A product life cycle normally involves several stages: product conceptualization, design, testing, refinement, mass production, marketing, shipping, selling, and servicing.

Dominique Hanssens, a professor in UCLA's Graduate School of Management, has studied the product life cycle in electrical appliances for years. He reports (Fraker, 1984) that years ago the product life cycle for refrigerators took over thirty years to mature, providing considerable time for each phase of the product life cycle to develop. However, all of this has changed. The market for microwave ovens has taken ten years to mature; CB radios, four years; computer games, three years, and so on. Perhaps the most dramatic example of shrinking product life cycles as a result of rapidly changing technology, quick market saturation, and unexpected competition can be found in the computer industry.

The first commercially successful computer, containing an 8-bit memory chip, came to market in 1977; four years later in 1981 the 16-bit memory chip appeared; two years later in 1983 came the 32-bit memory chip; and one year later in 1984 came the 64-bit memory chip. By 1987 we witnessed the appearance of the 1-megabyte memory chip, by 1989 the 4-megabyte memory chip, and by 1990 the development of a 16-megabyte memory chip was well underway. The industrial shakedown from such rapid changes has taken its toll on Commodore, Atari, Digital, IBM, and Texas Instruments and led to the

emergence of Japanese computer companies. Large U.S. companies, once dominant in their respective markets, such as IBM and DEC, who were unable to respond effectively to the end of one product life cycle and the beginning of a new one, lost their market position, with still other firms going out of the computer business.

How can a company manage to avoid these unpleasanties and prosper? What new techniques and skills must managers master to respond to this challenge? Only recently have executives who have responded successfully to this challenge begun to report a consistent pattern of attack which shows promise of providing a foundation for a new corporate perspective on how to respond to rapid environmental change.

A New Corporate Perspective on Rapid Change

Fraker (1984) argues that rapidly changing technology, quick market saturation, and unexpected competition have led to the emergence of a new corporate perspective for coping with a volatile business climate.

- *First, companies must stay close to both their customers and their competitors.* Successful companies always know what the customer needs and attempt to provide it. When products and manufacturing processes change rapidly, it is crucial to keep up with the investment strategies and product costs of rival companies. In order to accomplish this, companies must develop and maintain a rapid and accurate intelligence system capable of preventing surprises.
- *Second, companies must think constantly about new products and then back that thinking with investment fast.* A good new product strategy requires a large, active, and focused research and development team with ready access to and the prudent use of large amounts of capital.
- *Third, rapid and effective delivery requires close coordination among design, manufacturing, testing, marketing, delivery, and servicing systems.* The interdependence of these systems combined with the short lead time in product delivery make certain that any error within, between, or among systems will delay product delivery, endangering market penetration. Close cooperation among these systems requires strong, quick, and responsive integration, coordination, and control systems.

- *Fourth, product quality, user friendliness, ease of service, and competitive pricing are essential for market penetration.* In an environment where consumer and investor representatives compare, rate, and effectively communicate product differences, market penetration depends on quality, utility, and readily serviceable products. This in turn requires the active monitoring, testing, and checking the servicing of one's own and competitive products.
- *Fifth, companies which introduce new products must consider the processes and costs required to cannibalize their own products and to retrench the workers involved.* Companies faced with rapidly changing technology, quick market saturation, and unexpected competition must be prepared to change or withdraw their own products rather than let their reputation and market shares be eroded by a competitor. Corporate planning for new products must include contingencies for shifting, retraining, or retrenching large product sectors rapidly.
- *Sixth, a corporate culture must be developed which emphasizes change, allows for the assimilation of new units with alternative values, and encourages members to learn from mistakes without reprisal.* Corporate cultures which cannot change rapidly will impeded market adaptation. Corporations faced with stiff competition will often acquire other corporations with alternative values which will have to be integrated without delay into their corporate culture. Finally, a certain number of new initiatives are doomed to failure for all the reasons previously cited. Talented members of an organization must learn quickly from their failures and press on to new projects. A corporate culture's responsiveness to these issues will require a strong integration of labor and management interests, group and individual needs, and the values of consumers, investors, and the corporation.
- *Seventh, a corporate strategy must be developed which scans the globe for potential acquisitions, joint ventures, coalitions, value-added partnerships, and tailored trade agreements which can give a corporation a technological edge, market access, market control, and/or rapid response capabilities.* Such a pooling of corporate resources is necessary for survival in a rapidly changing, highly competitive, international economic environment.

Each of these seven issues forms the basis for a new set of corporate assumptions and practices regarding how to effectively reorient an organization to a rapidly changing business climate. This change in corporate orientation has led to the emergence of a new high-speed management perspective aimed at capitalizing on rapid environmental change in order to increase market shares and make large profits.

Executives Must Employ Management Assumptions and Practices that Emphasize Organizational Change

Being an executive in the late 1980s and the 1990s will be like playing basketball with a moving basket. With increasing rates of environmental change as well as the diversified nature of most large firms, continuity and durability of organizational strategy no longer guarantees success. Drafting 5 or 10 year strategic plans becomes an exercise in futility when the organizational environment changes so dramatically that long-term plans fail to adjust for transient targets. To compete in this and the next decade of transformation requires that executives create and maintain organizational assumptions and practices which help clarify and cope with continual environmental change.

(Ulrich and Wiersema, 1989:115)

Rapid environmental change creates organizational problems but also creates organizational opportunities. A high-speed management system is a set of theoretic and practical principles for responding to rapid environmental change. More specifically, high-speed management functions to decrease the response time required to get a desired product and/or service to the customer ahead of one's competitors. It does so by employing three separate theories and sets of practices. *First*, it employs environmental scanning theory to locate the need for new products and/or services and one's competitors' responses to that need. *Second*, it employs value chain theory to identify areas across and within firms where the information and communication processes involved in an organization's integration, coordination, and control systems must be improved. *Third*, it employs a unique continuous improvement theory in order to reengineer an organization's integration, coordination, and control processes, thus increasing the speed-to-market of products, thereby generating a competitive advantage.

An organization's management system, its integration, coordination, and control system, must have certain specifiable characteristics in order to respond to the opportunities created by successive, rapid environmental change. A management system which capitalizes on environmental change must be innovative, adaptive, flexible, efficient, and rapid in response—a high-speed management system.

Innovative management refers not only to product development, but innovation in corporate structure, employee utilization, outsourcing, inventory control, manufacturing, marketing, servicing, and competitive positioning.

Adaptive management refers to an organization's appropriate adjustment to change in employee values, customer tastes, investor interests, government regulations, the availability of global economic resources, and the strategic positioning of competitors.

Flexible management refers to the capacity of an organization to expand, contract, and shift direction on products and competitive strategy; to assimilate acquisitions, joint ventures, and coalitions; and to excise unproductive or underproductive units.

Efficient management refers to maintaining the industry lead in world-class products, productivity, investors' equity, return on investment, employee satisfaction, customer support, product quality, and serviceability.

Rapid response management refers to gaining and maintaining the industry standard in speed of response to environmental change.

Due to a shrinking product life cycle, today's new generation companies compete by decreasing the time required to bring a product to market. Such companies are innovative, adaptive, flexible, efficient, and rapid in response by concentrating on reducing if not eliminating delays and using this response advantage to obtain increased market shares. The organizational benefits which flow from a high-speed management system can be breathtaking.

First, order-of-magnitude changes occur in response time. General Electric reduced from three weeks to three days the amount of time required to deliver a custom-made circuit breaker. Motorola used to turn out electronic pagers three weeks after the factory order arrived; now the process takes two hours (*New York Times*, 1992:C3).

Second, order-of-magnitude changes occur in profits. McKinsey & Company management consulting group demonstrates that high-tech products that come to market six months late earn 33 percent less profit over five years, while coming out with a product on time,

but 50 percent over budget, cuts profits only 4 percent. More significantly, IBM obtained a six-month lead over all competitors in the mass production of four-megabyte computer storage chips. This occurred in an industry where the average product life cycle for storage chips is eighteen months (Vesey, 1991:25).

Third, order-of-magnitude changes occur in quality and productivity. In order to increase the speed-to-market of new products, organizations must reengineer and simplify all their production processes. This in turn, according to studies by Clark (1989), Gupta and Wilemon (1990), and McDonough and Barczak (1991), promotes a self-consciousness of organizational functions and processes which leads to improved product quality and increased productivity. Boeing, Intel, Sun Microsystems, and General Electric each achieved 10 percent per year increases in quality and productivity over a ten-year time span after implementing a high-speed management strategy (*Business Week*, 1993:79). A recent survey of fifty major U.S. corporations by Kaiser and Associates, a large consulting firm, found that all listed time-based management strategies at the top of their priority list. Why? Because speed of response tends to improve productivity, profits, and product quality (Dumaine, 1989:54).

Fourth, order-of-magnitude changes occur in investment turn-around and in market shares. A study by Nayak (1990:14) demonstrates that reducing the lead time of new automotive models by 20 percent was Toyota's most effective means of increasing the net present value of its total investment and increasing market shares. A company can thus regulate its exposure to risk by incrementally adjusting the newness of its products in the market and by fine-tuning its innovations with the help of customer feedback (Brown and Karagozoglu, 1993:37).

Fifth, order-of-magnitude changes occur in the diffusion of organizational power and in the flexibility of working modes. Gold (1987) and Millson, Raj, and Wilemon (1992) found that speed-to-market requires the early and participative involvement of all work groups in product and process design, increasing worker responsibility and organizational adaptability.

The implementation of this new corporate strategy and thus *the goal of high-speed management is the use of the new information technologies and human communication process to rapidly develop, test, and produce a steady flow of low-cost, high-quality, easily serviced, high-value products which meet the customers' needs and of quickly getting these products to market before one's competition in an effort to achieve market penetration and large profits.*

In the final analysis, a management system with high-speed characteristics can only be developed, implemented, and maintained by the appropriate use of information technologies within a unique communication environment, which adjusts people to technologies and technologies to people through the appropriate use of three interdependent communication processes—integration, coordination, and control. The uniqueness of these communication processes stems from the parameters placed on communication by the human communication-information technology interface and its effects upon organizational management processes. *It is this relationship which is at the heart of the high-speed management process.*

What are the unique principles, strategies, and techniques of high-speed management for resolving organizations' problems and capitalizing on the opportunities inherent in rapid change? What are the distinctive information and communication issues raised by rapid change? A theoretic and practical framework for resolving these issues and others will be developed in the next chapter, followed by an overview of the principles, strategies, and techniques of high-speed management to be applied in the remaining chapters of the book.