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A NEW WORLD BORN: IT IS MORE THAN JUST TECHNOLOGY

Appearances often are deceiving.

AESOP

The world of work, management, and business is changing. That reality is no longer in question. The real issue is what to do about it. As we move deeper into today's digitized and global economy, we must understand the transition underway, putting it into the context of what we know and will need to do. The successful transition from the old economy of the Second Industrial Revolution to the new economy of the Information Age calls for the careful application of the basics of business, because the fundamental laws of economics and sound management have not been abrogated. Many of the solid business practices advocated by Peter F. Drucker in the 1970s and 1980s, for example, are relevant today as we deal with the changes to many new elements of the economy.

Understanding the context and dynamics of the changes underway makes it possible for both nonmanagement and

managerial workers to apply sound business practices to new circumstances. This book argues additionally that these applications of business practices have to occur in an economic environment that is simultaneously in both the old and new economic order. That is not an easy thing to do. Bending metal in a manufacturing setting and navigating e-commerce are, however, today's reality. The bad news is that transitions always create complexity, risk, and yet opportunity. The good news is that there are things to be done that facilitate the transition. They range from applying the basics (e.g., making a profit), to welcoming and implementing innovative approaches to work (e.g., new supply chains).

Finally, the transition to a new economic order involves far more than technology. Computers and organizations have always affected each other and they continue to do so today. The ability of a startup .com firm to rely on the Internet as its major channel of distribution causes the CEO of that firm to create an enterprise that looks quite different from a manufacturing division at General Motors. Yet each sells goods. Dell Computers does not have a factory with 10,000 workers manufacturing personal computers, but sells them. GM still distributes the bulk of its products through a network of dealerships physically located in almost every town and city in North America. Yet GM is beginning to sell over the Net while Dell Computers has negotiated a series of agreements with firms that do have factories to build its products. Both show up at trade shows with their samples and advertising, advertise, and have employees dedicated to accounting, marketing, and sales. Each, in short, is a poster child for the old and new economies, each is demonstrating that sound business practices must be applied simultaneously to old and emerging economic circumstances.

Much remains the same, but much is also changing. This chapter is about context and perspective. Nobody operates in isolation—the market exists—and managers in particular must understand the economic ecology if they are to thrive in a contemporary role of management. To do the basics well, such as to hunt for profit, they are realizing that new ways

must be applied because the sources of profit are changing. That is why managers must understand the informational features of economic activity, the emerging new value propositions (how profits are made), the effects of globalization, and the digitization of so many business activities, all set within the context of emerging political realities. That is why it is helpful to start thinking of our time as a New Digital Age. In short, today's savvy manager must set the table before he or she can feast upon the role of management and work.

FOREMOST AN AGE OF INFORMATION ECONOMICS

During the last three decades of the twentieth century, observers of the business, social, and economic landscape warned that the “advanced nations” of the world were leaving the Industrial Era behind. They were headed into what Daniel Bell called the Post-Industrial Age, one marked by economic activity not rooted in the manufacture of goods. A small army of sociologists, economists, philosophers, and business consultants followed in his path, echoing a similar theme. Those who considered themselves also to be Futurists grabbed headlines with such popular books as *Future Shock*, written by Alvin Toffler, and *Megatrends*, written by John Naisbitt. The trend continued down to the present. For example, Nicholas Negroponte, author of *Being Digital* (New York: Alfred A. Knopf, 1995), provided a well-written, positive, even at times euphoric, vision of a world blessed with the benefits of information technology. However, at the same time we were pummeled with hype about the future, others commented more soberly about the same trends. Those thoughtful observers and effective guides to our future included such experts on business as Peter F. Drucker and Charles Handy.¹ Economic and business circumstances were changing by the early 1970s, yet we were still manufacturing and selling goods, and still eating farm-grown food. Were so many people just wrong about

economic and business realities, or was something else going on that proved difficult to see ten, twenty, or thirty years ago?

Quietly, beginning with the solid research of Princeton University economist Fritz Machlup in the 1950s, and continuing unabated by other scholars to the present, managers and scholars began learning a great deal about how the world was changing. The answers are not usually what the hype often suggested was happening. Yet the answers were just as profound, and just as significant for any understanding of the circumstances managers are increasingly dealing with at all levels of their organizations. Complicating our understanding of what is happening is the fact that transformation is occurring simultaneously in different ways and speeds around the world. Yet most industrialized nations, and, in particular, the United States and Japan, remained, for many commentators, the role models upon which they based their proclamations heralding the arrival of the Age of Computers or the Age of Information. Commentators frequently marveled at the miracle of modern agricultural innovations (mostly developed in the USA and applied around the world), or the manufacturing surge that occurred in East Asia (most notably in Japan, South Korea, and Hong Kong) after a decade or two of transition out of the consequences and devastation of World War II.² While I have more to say about developments around the world later in this and other chapters, I begin with some observations about the industrialized nations, that is to say, first the United States, next Western Europe, and, briefly, East Asia. By the end of this chapter, you should have a greater sense that information and information technologies are having an important influence on the nature of business.

When commentators say that the world is becoming computerized, or is stocking up on new technologies, most of these observers are referring to the USA, seeing it either as the bellwether for developments in other countries, or because they are Americans rooted in North American experiences. As they sit perched at the dawn of the new century, it is easy to see why their emphasis has been on the United States. By the end of the twentieth century, no nation had as successful an econ-

omy as did the USA. From the perspective of its structure—size and diversity—or viewed simply through the degree of confidence people placed in this country, it was a productive century enriched by the economics of science, technology, and a rising tide of highly trained, well-paid, motivated workers. Despite America's problems, from racism to Vietnam, it is the nation that fed the world, gave it the computer, landed on the moon, and demonstrated benefits of free trade and democracy. As the importance of the computer became evident by the early 1970s, it was most fully developed first in the USA, most rapidly deployed there, and most fully exploited there. And that was only one of many technological "miracles" that "blessed" this nation. Others included antibiotics, high-yield strains of corn and wheat, satellites, PCs, and manned flights to the moon. What a record of success this was for one nation! Hollywood writers could not have written a more compelling story line.

But economists quietly working at their universities looked at events and perceived and told the story in a different way. Beginning in the 1920s, when corporate industrial capitalism finally reached the form it would maintain for the next half dozen decades, the American economy again changed rapidly. Measured by sector, in 1920 manufacturing and agriculture dominated the economy, with services a blip. By 1980, services accounted for more than half of the economy, manufacturing for roughly a fourth of the action, and agriculture less than 10 percent.³ Why and how this happened is a long story outside the scope of this discussion. However, what you do need to recognize is that as the source of jobs and income shifted during the twentieth century away from agriculture and manufacturing and to services, the nature of work did too. The fastest growing piece of the American workforce in this century is the office worker. Economists use such fancy terms as "terciary" to describe this element, while many business writers call them knowledge workers. What happened here is truly revolutionary and profound.

Recently compiled data suggests that the growth in the percentage of the U.S. workforce population made up of knowledge or office workers between 1910 and the end of the

century went from less than 10 percent to over 70 percent. From 1960 to 1980, the rate of growth in this portion of the workforce ran annually at about 3.5 percent, versus just 1.1 percent for the workforce as a whole. In 1960 about 42 percent of all workers could be categorized as knowledge workers; by 1980 that total had climbed to 52 percent. In the 1990s, it reached the 70 percent figure just cited. While definitions remain fuzzy, and economists are still quibbling about percentage points here and there, the trend is no longer disputed. It is clear, dramatic, and important.⁴

An equally impressive rate of growth in the output of the American manufacturing sector and in the personal well-being of many Americans (the two cars in every garage syndrome) masked much of this transformation. The USA became a nation in which 99 percent of all homes had at least one television set and over 35 percent a PC with access to the Internet by the dawn of the new century. The computer in particular became very evident, first at work, then almost everywhere. Americans began using computers in commercial enterprises in the early 1950s and had thousands of mainframe systems installed by 1960. A nation long accustomed to inventing and applying technology in highly innovative, advanced, and successful ways, it seemed natural that Americans would include use of computers in their bag of tools. By the time the editors of *Time* magazine had named the computer "Man of the Year" in 1983, the public did not see this technology as rare or odd; it was familiar, and 1983 was the second year in a row in which over a million personal computers had been sold through retail outlets, by mail, or bought from direct sales forces, with over 90 percent of the machines going into the American market. From the mid-1950s on, technology and computers became almost synonymous; Americans viewed automation and computers as one and the same, and also as a familiar part of their working environments.

The physical presence of the personal computer in homes and offices increased sharply in the 1980s; today they are nearly ubiquitous, acquired by the tens of millions each year. As of this writing (2000) there are well over 175 million com-

puters around the world. In the 1990s, Europeans and East Asians began acquiring PCs in very significant numbers; large European and Asian corporations had already embraced telecommunications and large system computing for over two decades, also providing innovations in both hardware and software. In short, by the end of the 1990s, computing had become a very familiar aspect of modern work life across the industrialized sections of the world, and to a growing extent in what the World Bank or IMF would term “developing” nations.

Superimposed on the impressive deployment of computing technology today is, of course, the Internet, a technology which caught the U.S. public’s eye first, since it was developed in the United States by academics and the Department of Defense during the Cold War. What is particularly remarkable is the intensity of interest and the speed with which this technology became popular with Americans. Their interest ranks right up there at the same level they displayed in the 1920s when automobiles finally became affordable and easy to use. If there is a difference, it is that Americans embraced the Internet faster than the automobile, going from less than one percent having access to it in the early 1990s, to over 35 percent by the end of the decade. In the 1990s a similar yet slightly less intense surge in use of the Internet swept across Europe, East Asia, and to a lesser extent, Latin America and Africa. It became the darling of every “advanced” economy in the world with the partial exception of Japan. Centuries earlier the Cyber Gods had cursed the Japanese with a language difficult for keyboards that come with personal computers, but even in this situation, the Internet became irresistible.

Much about what we have been told concerning the new post-Industrial Age, however, missed one of the most profound changes to occur. Specifically, the change was our growing reliance on information as a source of wealth and income, and more precisely, the extent to which technology-driven firms became sources of new wealth and centers of economic activity. These changes sneaked up on Americans in particular, even though it has had a long run up.⁵ Information was never as obvious as a large automobile, as physical and boxy as a TV, or as conspicuous as the hardware of a computer. The com-

puter has its physical side—the core of which is the tiny computer chip about which I will have more to say—but also has its cerebral form, more data and knowledge created in the past half century than in the entire previous period of recorded history. Its artifacts—such as books and libraries—do not even begin to hint at the massive nature of this new item, one so lacking in the metal, wood, and cloth of earlier things, yet so essential to modern life and to the conduct of business transformations. The public received hints of the change, comments made from time to time about how fast medical knowledge was increasing, or how quickly engineers had their heads full of obsolete technical information. Those who had to upgrade their PCs and change software much too frequently sensed the explosion of information, knowledge, and its paraphernalia.

Information also proved so silent,⁶ intruding, indeed invading, our lives in very large quantities—like presidential polls, we knew too much too soon. Electronic forms of information came in sufficient (some would say vast) quantities that it became hard to appreciate how much was present. When information resided in books and articles, you could see how many of these existed at work or at home. Libraries measured their status by counting the number of volumes they owned. Scholars considered the U.S. Library of Congress the best because it had more books than any other. But a laptop computer today can carry the same amount of information as a small American public library has on its shelves, all in a package weighing less than five pounds. My laptop has a complete encyclopedia, residing in one file out of hundreds. I have no idea how many pages of material I have in my machine. I only know that there are drafts of three books in it, over a hundred business-related documents of article length, along with all my “real” work for my employer.

Another feature of information is the way it came to be such an important part of work. The foreman of a team of ironworkers at the dawn of the twentieth century had access only to knowledge that he knew, and to that of the few co-workers in his community. In short, his library or database

was largely resident between his ears, and he probably had limited or no access to any other body of knowledge on his profession. Today, a foreman of ironworkers most likely has a laptop filled with blueprints describing what has to be installed, complete with networking capability to other databases and project plans, possibly to an Intellectual Capital System. If he works for a very large construction firm, e-mail and a cell phone link him to his company, Web sites get him to the Internet and to data belonging to professional organizations. The hidden revolution here is the intrusion of additional information content into otherwise highly traditional jobs. Another quick example illustrates the point. Notice the little radio planted on the shoulders of most police officers in Europe, East Asia, and North America. They are all wired with telecommunications back to a central phone bank where they can get information, communicate what is going on, and obtain assistance. Before a police officer takes action on the street, he or she can routinely ask for additional information that helps, such as whether the person they are dealing with is a dangerous criminal, or has an outstanding arrest warrant.

Both American and West European government agencies that measure features of national economies have only just begun to tell us about the “information economy.” They are now publishing task force reports heralding the arrival of this new economy, but they are just barely beginning to reflect that reality in their routine economic data-gathering activities. Their reports on the “information economy” are still sporadic events, occasional, and the subject of press coverage as new news. In addition to not yet institutionalizing the collection of hard economic data on the changing economy is the fact that we still do not have solid agreement among economists or government agencies about what makes up this new sector. In the United States, for example, the government still uses industrial-age industry codes that categorize everything from asbestos manufacturers to zoo keepers.⁷ The OECD, one of Western Europe’s major economic data reporting agencies, is also very industrial in its perspective about European economics.

Efforts that have been made to redefine work (labor content, assets, and monetary values such as revenues) suggest

several clear patterns. First, various important government agencies in industrialized nations recognize that they need to reform their reporting on economic matters and, therefore, have started the slow process of reform. It appears this process is replicating efforts governments went through between the two world wars to set up the reporting mechanisms they have for today's industrial economy. Second, there is growing recognition among economists and government officials that information technology is adding economic value and, increasingly, is having a positive effect on the rates of national productivity of both workers and physical assets. There is still a struggle going on over the question of how to value soft assets like software, however. Third, that second issue has not slowed the attempts of national governments to continue supporting national champions. The Japanese still support microelectronics and software development, the Americans support improvements in chips, software, and telecommunications, while the Europeans increasingly are supporting telecommunications and application software projects. This third trend began in the 1950s and early 1960s with governments supporting computer manufacturers but, after the Americans and then East Asians came to dominate the hardware business, they moved on to other leading edge technological opportunities.

The implications of the changing economy are becoming increasingly obvious. One is that people earn more income and increasingly live out their work lives in a market richer in ideas and data. Those who like to hype the issue in essentially negative terms speak of the end of work and the de-skilling of people as computers and robots get "smarter." Instead, something quite different has already happened. The number of hours people work has not gone down since the enemies of automation began scaring workers as early as the 1950s; rather, they are up, and most so in the United States and Japan. The demand for better-educated, skilled workers to use all this new sophisticated technology has also gone up over the course of the past half century. Work happens faster and in a greater variety of forms. These currents of change—automation, de-skilling, richer information content, and so forth—are

some elements of the new economy. While they may seem contradictory or unrelated, they exist in one form or another simultaneously.

Products also have information and services wrapped around them. A quick example illustrates the point. In the 1960s, almost all of IBM's revenues came from the lease of computers and related hardware. At the start of the new millenium, nearly half its revenues came from hardware, the rest came from providing services offered by highly skilled employees. In other words, IBM was generating tens of billions of dollars by renting out their people's brains. Microsoft's stock value is greater than that of General Motors, yet GM has tens of thousands more employees, and mountains of hard assets in the form of automobile parts, factories, and vehicles. In Seattle, home to Microsoft and Boeing (one of the world's largest airplane manufacturers), it is Bill Gates's operation that is now the leading local employer, not the aircraft company. SAP, a highly successful European software firm barely a decade old, is worth more than many well-established and distinguished European firms. The stock of America Online is worth more than that of all the major TV networks in the U.S. put together. Add in the Time Warner merger with AOL, and you have the largest telecommunications/media company in the history of the world. The point is that the creation of wealth and profit is not limited to one country or one industry, let alone to the manufacture of hard goods, nor to such traditional trades as retail and personal services, such as hair stylists or construction. Wealth is being accumulated rapidly, mimicking the patterns of earlier decades when great fortunes were made quickly in railroads, steel, chemicals, telephones, and print media. It is no accident that the richest man in the world—Bill Gates—made his fortune in the information economy, nor that he and two other colleagues at his firm make up three of the four wealthiest individuals in the world, and are soon to be followed or displaced in that ranking by .com founders.

Information economics also affect firms not traditionally thought of as being in the information business. Many North American trucking firms are equipped with onboard PCs that communicate their inventory, status of their delivery efforts,

and query corporate systems for directions. UPS, another transportation firm, tracks every package in its possession, making it possible for customers and employees to know at every step of the way where things are. In fact, most package delivery firms of any stature today have some sort of a computer-based tracking system. Clothes manufacturers track demand, orders, and production with computers to reduce the amount of time between when a customer wants a piece of clothing and the time they get it. The objective is to make the right piece at the right time, with minimal investments in warehousing and inventory. Apparel manufacturers are very high-tech, data-intensive industries today, operating in many countries, closely linked to Web sites and to their retail partners around the world. The Internet has provided yet another wave of convenient technology, forcing important structural changes across almost every major industry around the world, and all in less than a decade. But I present more about that process in Chapters Four and Five.

Changes, even though underway for some time (because nothing evolves as fast as we are often told), still have a freshness about them that creates uncertainty in the hearts and minds of people. The problem is never the change or trend itself; it is the unintended, or even worse, unpredictable, consequences that catch a company off guard, spoiling anticipated performance. In the early 1990s, for example, an online book seller—Amazon.com—came into existence and quickly claimed to be the world's largest book dealer. It used technology to provide customers the kind of personal attention that had begun to disappear from the big chains, such as suggesting other books a potential customer could buy by relying on software to identify titles. Minimum-wage employees in physical book stores could not always compete against good data mining software. Virtual book stores stayed open twenty-four hours a day; the traditional stores did not. The major American book chains, such as Dalton, Borders, and Barnes and Noble, already in a process of traditional consolidation into larger ones, found their market shares challenged. The new Internet-based firm was not only selling a lot of books, but was also collecting information about customers' buying habits,

which made it easier to let patrons know about new books of interest to them. Brick and mortar bookstores scrambled to get online as well. While some have been successful in preserving market share, many smaller firms disappeared, unable to compete, speeding up a process of retail consolidation in that market which had begun in the 1980s.

Utility companies all over the world face tough competition from each other, less because of deregulation than from a firm's ability to use information to compete effectively for a client company's electricity needs. Energy brokers on the "Net" are disrupting traditional patterns of business by bringing customers and suppliers together. Knowledge brokers are appearing in other industries as well. If I want to buy food from a supplier in another state, I don't have to rely on my neighborhood grocery store anymore. These are the kinds of trends and events that make managers very nervous while complicating the life of a consumer. On the other hand, customers are getting more choice and greater value. New business opportunities are emerging and people are making money.

THE SEARCH FOR A NEW VALUE PROPOSITION

Companies like IBM, AT&T, Microsoft, and Cisco live at the crossroads of traditional ways of making profits and are at the point in the economy where many new opportunities and risks exist, created by technology-driven changes in business. Earlier than others, they began to worry about how to run their businesses in this new world. The questions they continue to raise are the same for most corporations, small companies, and even independent business entrepreneurs. Perhaps nothing has caused so much churn and managerial nervousness as the arrival of the capability of doing so much business using telephone networks. You and I think of it as the Internet, with personal computers and telephone lines.

The issue boils down to a hunt for a new value proposition (what one offers to sell or do in exchange for a customer's cash) in an economy in which networks are transforming how people live and work. Those who find answers thrive, just as so many did when they figured out in the late 1800s and early 1900s that corporate capitalism was the way to go. Put another way, managers are asking themselves: "How can we make money and sustain traditional levels of economic growth during a period that so many agree is undergoing a revolutionary change into a network dominated one?" In this new era the issue is less a question of how best to use information technology (usually its capabilities), but rather one more closely linked to the primary driver of the current round of changes: telecommunications.

By their nature, networks operate independent of geographical barriers, showing no respect for national borders or authority. Networks have come into their own at precisely the same time that the world is going through a wave of free-market reforms, about which I have more to say later. As a consequence, we are experiencing an enlargement of traditional markets across a wider geographic footprint than ever with the technical wherewithal to perform successfully when we figure out how to do it profitably. The cases we see—such as global giants IBM, ABB, and Phillips—are augmented by the unique new cases—such as Amazon.com and eBay.com—providing a clear indicator of possible futures. It is also becoming clearer that the capabilities of computers in the 1970s and 1980s set the table by making the networked world possible and actual. But it is time to move beyond that realization to some emerging realities.

The first new reality to recognize is that universal access to networks is already across most industrialized and developing nations, making it possible to reach just about anybody or any organization within advanced and emerging economies. This universal access is primarily due to the availability of the Internet and relatively cheap PCs. Literally every employee and firm has the option to leverage this access or to ignore it. Concurrently, every worker and organization is affected by the

fact that everyone else has access to the network and many are using it. Use it and new things become possible, ignore it and new forms of competition eat at a firm's bottom line. As a result, new rules of commercial engagements are emerging to replace, or sit side by side, with more traditional rules of the game in capitalist economics. Some industries are more affected than others; few are escaping the effects of the Internet. Those with extensive information content or the ability to conduct online transactions are profiting the most and the soonest if they are taking advantage of the new technology.

The second emerging reality is the enormous investments being made in networks and information technology, over and above what is being spent on the Internet. These investments, as measured by percent of a nation's GNP spent on them, are at an all-time high. Within these investments are expenditures for computers and software, telephone systems, wireless communications and their networks, and a mountain of digital devices ranging from PDAs (personal digital assistants) and pagers to personal computers. In the United States, for instance, the percent of GNP spent on IT has been rising at better than two percent per decade. At the end of the 1990s it had reached nearly eight percent, and the number is higher if we include telecommunications.⁸ The phenomenon is also present across the world. The result is a global movement to invest in the information infrastructure necessary to convert the hype about a digital world into reality. On a global basis this is well underway. The 16 largest national economies have shown a consistent and increasing percent of GDP expenditures on information technology (IT) throughout the 1990s, from an aggregate of less than one percent to over five percent. This data is for both the U.S. and the 16 nations, but it only reflects IT expenditures and not the costs of end users (such as salaries for those baby-sitting this technology or using it). If anything, the figures understate the true expenditure on information technology. My own research suggests the understatement is off by a good 100 percent. Regardless of the exact numbers, they are big and the trend is clear and obvious. Forecasts for the first few years of the next millennium suggest an upward curve with expenditures doubling within a decade.

This pattern mimics what occurred with the spread of paved roads and electricity in the middle decades of the twentieth century.

Interview any senior government official or corporate executive and you hear the same expectation: that e-commerce will increase profoundly. That expectation is the third trend, one worth taking seriously because these managers are investing overwhelmingly with that expectation in mind. So we have the self-fulfilling prophecy at work: the world moves to an information-based economy, whether it needed to or not. It is not worth debating the probabilities any more. That train has left the station. Executives have already voted with their budgets that information technology has value. Various industry studies suggest that business-to-business electronic commerce is expanding fast and first, perhaps as quickly as five to ten times the rate of the other form of e-business that seems to get all the attention: business-to-consumer e-commerce.⁹

The “killer application” currently dominating business-to-business exchanges involves open-market trading with the result that those using net-based business strategies are strengthening competition among sellers while lowering overall operating costs. This pattern stands in sharp contrast to the more equitable partnership-like transactions and sharing of economic benefits that accompanied more traditional Electronic Data Interchange (EDI) applications in the 1970s and 1980s. But even with that historical precedent we experienced partnerships made possible by the use of technology, as we are now beginning to see again with use of the Internet.

A new concept is appearing in business circles with the nickname “value nets.” These “nets” are gaining momentum, becoming central to exploitation of net-based business. They are also becoming major components of grand strategy. So, what are they? Value nets are the combination of telecommunications networks, services and products of a firm, and the processes needed to exploit such technology for economic advantage. Currently, they are attractive because they reduce costs of coordinating business activities across organizations; hence the enormous resurgence in refurbishing supply chains

that occurred in the late 1990s and beyond. They make it possible for multiple organizations to work together without having to become legal parts of each other, thereby avoiding the complexities and costs of traditional acquisitions and mergers. They make it possible for organizations to come together only for as long as there are sound economic reasons to do so, unlike the more traditional merger or acquisition which is a permanent arrangement—and, thus, a less fluid and a slow way to change. In a value net, the strategic unit is the collection of organizations within it. Those organizations can be many corporations, not simply departments within one enterprise. The benefits of nets seen so far include flexibility, speed in implementation, lower costs of operations, and greater access to markets. Their most important feature: They work.

Lest I mislead you, traditional mergers and acquisitions in the New Digital Economy are still very attractive. In fact, in the 1990s around the world we experienced as big a round of mergers and acquisitions as occurred in any other decade of this last century. Why? Part of the cause is IT. As technology made it possible to manage ever larger enterprises, across bigger tracks of the world's surface, through communications and data handling, it became possible to build ever larger enterprises. In some industries, such as banking, communications, publishing, media, music, and utilities, if you did not scale up, others did, leaving laggards exposed to shrinking market shares and economies of scale too high to compete with the larger enterprises. Customers encouraged the process by demanding their suppliers provide services wherever they (customers) are. If you rent cars from Hertz, you want Hertz wherever you go in the world. Banking services within nations, such as the large market making up the United States, became the premier example of scaling up through M&As, using IT to make it all work.

While discussing how companies are scaling up through M&As, I should note that one can partner, or use technology, to accomplish the same task. Remember Amazon.com and books? After this firm got into the book business, it quickly realized that readers also bought CDs, and so the firm started to sell music to the same audience and, in the process,

acquired new customers who did not necessarily buy books. By the end of 1998, the company got into the business of selling pharmaceuticals because it required the same process as selling books and CDs. Late in 1999, the firm expanded its selling apparatus again to include a wide variety of goods sold online. As *The New York Times* described it, the firm “would transform itself into an Internet shopping bazaar, opening its popular Web site to merchants large and small for a minimal fee. In return, the selling powerhouse, which started as an online bookstore, will gather huge amounts of information on the buying habits of consumers.”¹⁰

Competition in this brave new world, while it has many of the features of the Industrial Age, also includes new conditions. Customers have the ability to return goods faster, to change suppliers quicker, and do so more frequently and easier than in the past. Much has yet to be learned about how to compete, but what is clear is that a new business model often has to supplant what a business had before. New businesses can and do jump to business models unrecognizable to pre-existing firms. All the Internet startups of the 1990s are cases in point, for example, e-Bay, Netscape, Lycos, and so forth, and all those that have been evolving to new forms, such as Amazon.com.

Manuel Castells, who teaches at the University of California-Berkeley, is today's most informed sociologist studying the networked society. He has pointed out, like so many others, that over the past two decades governments and societies have been experimenting with new economic models that go past the Keynesian formulas originated in the 1920s and 1930s. Why? Because the economic shocks of the 1970s, in particular as a result of the oil crisis and global inflation, called into question traditional approaches. At the same time, new technologies created different economic and business opportunities.¹¹ Central to the evolution toward a newer model, maybe even to one that has some of the features of the old mercantilist approaches of the eighteenth century, has been the use of information technology. The obvious examples are the partnerships currently underway between industries and govern-

ments in such diverse countries as Ireland and Malaysia. Economic progress in the 1990s vindicated the tinkering with the pre-World War II industrial capitalist model that was well underway and which matured during the period of the Cold War.

This tinkering resulted, for example, in extensive deregulation of many industries: utilities, transportation, telephone, telecommunications, trucking, utilities, even public education. All through the 1980s and 1990s, government agencies privatized, such as the U.S. Postal Service (USPS), one of the largest public privatizations in the world. Even the Chinese are doing it. However, the Russians hold the world record for recent privatization, with thousands of government-owned facilities now out of public ownership, done in their mad rush toward a capitalist economic structure.

Productivity of labor and capital increased all through the 1990s in the forms of downsizing and process reengineering. These trends occurred simultaneously by the realignment of business missions and objectives, and the implementation of mass customization and new forms of production (e.g., using the Toyota manufacturing model). These activities were at the heart of many quality management practices of the 1980s, layoffs in the 1990s, and creation of as many new jobs increasingly more dependent on computer and other technology-based skills.

Further integration of global cash flows and the continued increase in capital availability around the world over the past 40 years also facilitated rapid exploitation of potentially profitable markets when combined with telecommunications. Opportunities are normally not constrained by national frontiers as in earlier decades. Free trade, cheap capital, relatively good transportation, and effective telecommunications networks have, instead, had the unintended consequence of making information-based skills and use of knowledge management strategies crucial success features for many businesses today.

In a series of studies conducted by IBM, beginning in the mid-1990s and nicknamed Watershed, the company's management consultants searched on an industry-by-industry basis

for those enablers that were becoming the building blocks or stimulators of new economic models. While these varied by industry and country (the study was global in focus), four enablers jumped out very quickly as widespread, cutting across many industries. They are:

- Growth in implementation of networked business strategies
- Increases in individual technical skills
- Expansion of digital and other intellectual assets
- Continued technological innovation and use of standards

In some ways they are obvious. Take the first one—growth in computer and other technical skills. The U.S. Census Bureau has reported that the use of computers by children at home rose every year since 1984, with over 30 percent saying in 1997 that they used this technology. Their parents were using the same equipment at work.¹² Among high-income households—the source of a very large percentage of business managers and knowledge workers (e.g., software programmers and management consultants) working in the United States—the number came closer to 75 percent, up from 22 percent in 1984.¹³

Some implications are evident. Those industries heavily reliant on information, such as insurance, media, and banking, are feeling the effects of the networked economy's evolution sooner than those tied to physical manufacturing of low-tech goods (e.g., cement or plywood). Others are being pushed into the new era, such as manufacturers of cameras and film producing digital image offerings. As a generation of economists have now taught us, those industries that are information intensive and employing a high percentage of knowledge workers are finding that the management of information is one of the things firms and government agencies have to do right if they are to be competitive. Finally, there is the customer who is gaining increased access to information useable to negotiate better terms and conditions for goods and services. Power in the marketplace, which has been shifting to consumers slowly throughout the 1990s, appears to be gaining momentum. So

the quality gurus were right: Businesses are paying very close attention to the needs and wants of customers.

If the value net, then, is the organizational artifact of the networked age, what does it look like? Is this the construct managers are moving fast toward? The answers are only just beginning to emerge, and it is not clear that the picture we have is correctly described. But we know some things.

First, the new value chains are dynamic, fluid, and involve multiple enterprises. Michael Porter's original model of the 1970s and 1980s is sitting on top of a footprint encompassing many organizations and undergoes rapid transformation.

Second, in this emerging environment the best focus is on the core competencies of the business rather than on simply leveraging existing assets. That means firms create value in the market with more than a product or service. They rely more on their ability to coordinate cost effectively across a variety of cross-unit dependencies. These dependencies are suppliers, substitutors, customers, and complementors. Suppliers can be both internal and external. Substitutors are competitors and outsourcers. To senior executives today these are probably the most obvious element of the equation. Competitors in this new world are most familiar to line management and employees; they are the rivals who rapidly take away value add through the use of networks (e.g., remember the early rounds of competition between booksellers Amazon.com and Barnes and Noble?). Customers may be new, different, or continuous. Complementors are those who significantly influence who becomes a customer or supplier, such as advertisers, business partners, and other satisfied customers.

Emerging as the key to success is a firm's ability to be flexible and cost effective. A company must be both simultaneously. Direct access and accountability in the marketplace leads to a firm learning very quickly how it is doing, and to rapidly understand its value add. It is also becoming clear that the definition of value add changes, often frequently, hence creating a need for flexibility in responding to market conditions. Speeding up delivery of the right services and goods, and doing so cost effectively, becomes even more of an imperative

than in the past. Furthermore, because of the need for agility and knowledge, traditional command-and-control management styles just don't work as well as in the past. Often they are too slow and far too dependent on the judgment of managers, who may not be close enough to the action. This is especially the case in large corporations where either five or more layers of management or some sort of matrixed management structure exists. In either circumstance, distance from the action is normally the problem. Empowered, well-trained teams increasingly are acquiring authority and responsibility for doing the bidding of the firm. In short, distributed forms of organization and management become the norm in this environment. That is why so many smaller firms can do so well against the giants of old: They naturally are simple in form, and agile.

In the emerging digital economy, a firm can decide to create a new environment (a push approach) or respond to recently identified marketing opportunities by attracting customers (a pull strategy). In the first case, a company selects products and services to offer, enters a market and, if effective, gains rapid market share. Such a firm can create incentives for other providers to join its value net and influence market perceptions, as Amazon.com began to do in 1998–1999. Motorola was a very early example, with its initiative to create a global cell phone network. Using its new learning about products, a firm can capture additional market share by replacing its initial offerings with others before its competitors learn what the earlier entrant has come to understand. Many Internet-based firms are expanding exactly this way, adding new lines of products, displacing old ones, and upgrading others in an effort to appeal continuously to existing and potential customers.

Those who choose the second strategy—to adapt to market opportunities—also stay very busy. They have to identify a profitable value net very early, quickly establish close ties to providers and customers, and compete extremely aggressively for share. Over time, they conclude that they must exploit whatever brand power they have, like a Coca-Cola or IBM, or, to use an Internet example, Amazon.com, one of the newest

and best known new Internet brands of the 1990s, or Dell, one of the newest technology brands of the same decade. There is also the requirement to undermine those who would lock them out through advertising and capturing mind share. Because everything speeds up and has a shorter life cycle in this new period, case studies of success and failure are already numerous. For many, the story is one of eliminating physical assets and employees in exchange for electronic access and construction of value nets. The very earliest example, dating back a decade before the Internet, yet network-based, was the ATM terminal, which replaced the bricks and mortar of branch banks and tellers. Now, picture a similar phenomenon across many industries, but instead of with an ATM, a personal computer that costs less than \$1,000. Get your customers to order their own airplane tickets off the Internet, for example, and you eliminate the need for some ticket agents; show homes over the Internet and you reduce the number of real estate agents needed. Bottom line: goodbye geography and manpower, hello Internet access.

GLOBALIZATION AND DIGITALIZATION

So IT expenditures are up all around the world. Castells, the NUA Internet surveys, and government forecasts in the USA and from OECD countries all report the same thing. The world is continuing its long-standing tradition of integrating economic activity, transportation, and communications.

Normally, discussions of globalization of business and the role of the computer chip—what I refer to as digitalization—are not seen together, but they are inextricably linked. The reason is relatively straightforward: To a large extent, deployment of computer chips in products, transportation, and the all-important collection of communications tools has really moved globalization from being either a loose affair, or rhetoric, to a hard, tangible reality. This situation is relatively new. To be sure, globally based trade has been going on for centuries. Camels loaded with spices from Asia were regularly led

into western Europe for at least three thousand years. Ships made the issue of free trade a major topic of policy and practice by the Phoenicians, during Roman times, and again in the eighteenth and nineteenth centuries. Before the invention of the computer chip in the 1950s, the United States and Great Britain had become powerhouse exporters. But in the last fifteen years of the twentieth century, global activity went to a higher level of integration than we have ever seen before, and it did it in very few years, faster than any earlier step toward globalization had been taken in recorded history.

I want to discuss globalization in different terms, however. Many companies recognize that they can sell products anytime anyplace, and that money moves through the global economy hundreds of times faster than it did a century ago. They recognize that governments have limited abilities to constrain or characterize how trade is conducted. Despite the American embargo on Cuba, those who want them have always been able to get Cuban cigars in the United States; illegal drugs flow in and out of nations in huge volumes, and Russian nuclear fuel is for sale. But those realities have been with us for nearly a half century. Instead, look at the changing nature of legitimate commerce. What is occurring is more global implementation than ever, evident in such diverse parts of the world as Western Europe, Singapore, and North America. Companies fit the model more or less, but none escape the changing nature of commerce. And that is the point; we are beginning to see a new homogeneous model of business behavior developing, which is increasingly becoming familiar to managers around the world and with which they deal. It is more pervasive in its deployment. Four features characterize this new model of the emerging global economy of the early twenty-first century, characteristics that make it tangible for firms and consumers alike:

- Product proliferation
- Decline of physical markets
- Parallelisms
- Informationalized economic activity

Commentators on today's business environment have all discussed one or another of these aspects, but usually not together. All four are simultaneously influencing the nature of commerce and the hunt for new value propositions, with each influencing the other. All four are profoundly affected by digital tools, about which I have more to say later.

One very obvious trend has been the increased availability of many types of products, with far more options than fifty, twenty, or even ten years ago. For example, in the 1950s in the United States, there were five national brands of carbonated soft drinks: Coca-Cola, Pepsi-Cola, Orange Crush, Dr. Pepper, and 7-Up. (Root beer and ginger ale are not considered carbonated drinks.) How many dozens are available today? Now add in scores of variations of bottled teas, fruit juices, and water. Even for very new things that did not exist a generation ago, there is variety. For instance, a person can buy nearly 150 brands of personal computers, although a half dozen dominate the market. Television came into our homes forty years ago using antennas, then it became possible twenty years ago to use cable as well. Next we could add a satellite dish as yet a third option. Today cable is available from cable companies, utilities, and telephone providers. Dishes can be acquired from telephone companies, electrical utilities, and from retail outlets selling electronic products. Once dishes were big and cost over \$10,000 each; now they are the size of a food platter and cost less than \$300. While most observers of the new landscape rightfully point out that consumers today face wider choices (hence greater complexity in their hunt for values), so, too, do providers of goods and services.

To a large extent variety is driven by the capability of manufacturers and service providers to offer custom-made goods for the same price as mass-produced or common services. That is the basic idea behind mass customization, which began in the 1980s in manufacturing and now is embedded deeply in services as well. In manufacturing, use of technology (and, yes, the computer chip) made it possible to make customized products for individual customers at the same price as mass produced ones.¹⁴ In many parts of the world, our expectations have reached a point where specific offerings rel-

evant to the individual customer, and not merely to a market set, are a prerequisite for success.

But standard products have not gone away, far from it. Walk through a village market in Southeast Asia or in the Middle East, or even through a K-mart in the United States, and you can see the proof. But the existence of both situations—more standard products and greater ability to customize them—is a feature of the new global market. It is not a question of the global economy—we have had one for a long time. To repeat, the issue is one about a global *market*, one populated with customers whose expectations are similar and dissimilar around the world. That is a new situation. The duality of the standard and the custom-made raises many questions for both suppliers and customers. Both share growing complexity in options and in how managers deal with their design, manufacture, delivery, and support. This is very much at the heart of the hunt for a new value proposition, the value net discussion presented earlier.

The implications are enormous. But five issues help managers focus on the steps essential for companies to take to succeed in this new environment.

First, profitable pricing becomes more complex and dynamic as it desegregates or differentiates. That principle was at work with the price of airplane tickets where two people on the same flight in coach class paid different prices for the same ride. Now you see it with other products and services and you will see more differential pricing in the future across a broader range of services and products.

Second, the importance of branding remains as customers seek out trust, relationship, quality, and familiarity. Every major survey of customers on branding issues done in the industrialized world in the past decade confirms this pattern. Hence the renewed interest in branding work by firms. The new frontier is branding in a net-based market. Companies are learning what constitutes effective branding and advertising on the Internet. The answers are not all in yet but a great deal of experimentation is going on with the issue because branding and advertising are core activities of any firm.¹⁵ For many

customers it is the only unchanging rock they can cling to in their search for quality and a fair price.

Third, global visibility of products, services, and pricing offers customers the potential to build their own pricing and value propositions. Some personal computers are made to order, no two have to be intentionally alike in configuration or price. Blue jeans can be cut and sewn to fit a customer's body precisely; homes are designed online and then physically constructed. In each case, the use of modeling tools to design and price, and then the use of software to manufacture or deliver, are what make it cost effective (or priced right) to tailor.

Four, branding or co-branding and private labeling approaches are on the rise to target markets of one or few customers. This trend is a byproduct of individual customers defining their own needs and values, coupled with renewed branding initiatives by providers.

Fifth, questions are being raised about whether companies should differentiate products they make by adding services and knowledge to them. The response is increasingly yes, because of the global trend toward mass customization. Who today would offer to sell a car or major appliance without ranges of service support?

Now, let's deal with the decline of physical markets, which I think is a far more precise way to speak about global economics because it affects the work of managers. Historically, selling and buying took place somewhere, in a store, market, even on a street corner, but usually at a predetermined spot on earth. People made goods, moved these to a store, customers bought them, and hauled them home or to work. Increasingly, we are seeing the disembowelment of physical markets. In less prosaic language, what is happening is that the eye-to-eye, face-to-face contact between buyer and seller is either being replaced or supplemented by different approaches. The most obvious at the moment is electronic commerce. It is easy to exaggerate here, since Internet purchasing is expanding at the moment at a very rapid rate. To be sure, the vast majority of sales are done the old-fashioned way, with customers going to stores to make their purchases. But retailers are having to deal

with both modes of sales simultaneously. That is a new circumstance for them and their customers.¹⁶

There are cases that, on the surface, may seem exaggerated but are, instead, exceptions that point toward the new future and thus should be taken into account as well. The anecdotal case of selling computers and books online is a case in point. Dell, for instance, took six months to sell its first million dollars worth of computers via Internet channels. Within the following six months, Dell had enjoyed its first million-dollar-plus day of sales. Now, over half of its significant sales volume comes through Internet commerce. The public is often swept up by such stories and might miss the bigger story that an extremely low percentage of companies enjoy this sort of Internet-based success. What is very clear, however, is that many firms are engaging the Internet as yet another channel that they must master, raising many questions about how to do that.

With the decline of physical commerce, questions arise about customers' expectations. We have one expectation about décor, product visibility, and price when we buy at a garage sale, another when we go to a hardware store, yet a third if we are buying in the old market in Cairo, Egypt. Take those away and what are their replacements? What standards do vendors and buyers want in an environment where the physical is supplemented or totally replaced with, for example, an online buying experience? This is happening as companies go global. Someone buying a book in Western Europe by logging onto Barnes and Noble's Web page misses out on the fun and neural stimulation provided by the firm's beautifully and cleverly designed book stores. How does one get that customer to buy from Barnes and Noble? The emerging answer so far is to provide fast service, best prices, a mammoth inventory, and excellent data mining to call attention to other titles of interest to the customer. Again, the computer chip is at work.

Closely related to the loss of face-to-face physical buying is the decline in the "touch-and-feel" that always came from squeezing the oranges or test-driving the car. The ability to determine how fresh foods are has historically been very

important in influencing the buying decision. Price is important too, but freshness first. If sold remotely—as increasingly is happening in the USA during the Christmas holiday season—we eliminate the physical experience. So how do we establish freshness? Guarantees? Fabulous photographs? Reputation (branding)? Other questions concern packaging for delivery, support, and selling techniques in a virtual market. What is a customer conditioned by previous prices willing to pay for delivery in a virtual market? Will a customer pay five to ten percent more in exchange for convenience of delivery to home or office? They pay that much additional for fast delivery, but what about for convenience? Does the answer vary by type of product, time, or industry? Since discounting is already widely evident on the Internet, do they want the combined purchase and delivery costs to be below what they would have paid in a physical market? So far, what is clear is that they want lower prices and are getting them.

The point is, there is a growing set of new issues and implications for management to address. The decline of physical commerce suggests some obvious ones:

- Value chains for manufacturing, marketing, and delivery of goods and services change.
- Loss of the physical market. What are the *new value* propositions?
- Potential effects on brand loyalty and familiarity also change when goods and services are sold remotely. How do they change? Does that hurt or help the firm?
- Recourse for consumers wanting to replace a defective product. How do you do that? Who enforces quality standards, a government agency where the consumer is or where the vendor sells or makes the product? How is the market able to enforce standards via competition? The economists are not sure how to answer this last question.
- Role of government safety and taxing authority changes. Look at the current debate about what to do with sales taxation of Internet-based commerce underway in the

U.S. Focus on decisions made on this point concerning catalog sales for some early answers.

- Definition of a market, an industry, or a set of customers changes.
- Movement of value for a customer shifts. Even some “experts” do not know what that means, and they are speculating on answers.
- Customers defining their own channels, or hybrids of channels, with implications for profitability for existing firms. New firms link profit expectations to these emerging realities without stranded commitment (e.g., capital investments) to old investments or practices.
- Potential for pervasive, ubiquitous distribution.
- Coexistence of multiple supply chains.

The most important recent development, because of its visibility, is the issue of lost physical commerce because of the arrival of new entrants into traditional markets. These new businesses are not necessarily burdened with heavy capital budget requirements. Brokers who buy, customize, sell, or advise on products without a storefront represent one obvious and early example. Many merchants do not need stores, just catalogs and contacts with manufacturers. Knowledge or data appear in an electronic channel delivering value, such as the information a broker finds for a customer on the best rates in the nation for a loan, charging a small fee for this service. The second way the nonphysical market has emerged is evident in the USA. In fact, the nonphysical market existed even without benefit of the Internet with television programs that sell products one can call in to order (e.g., QVC). By the late 1990s a similar process had emerged on the Internet with the various auction houses (e.g., eBay) and through virtual general markets (e.g., Amazon.com).

In addition to the decline of physical selling, we need to recognize the issue of parallelisms in the global market. If history has taught us anything about change it is that people, companies, governments, economies, and nations do not change *en masse* at the same time. The process is an evolutionary one, a trend characterized by coexisting offerings,

hence the notion of parallelism. Old markets stay or disappear at various rates over a long period of time. New ones do too, existing, however, parallel to older ones. The consequence is economic strains for all, and some confusion for those of us who must describe the market landscape, a messy process. There is the traditional vendor experiencing new forms of competition, a new supplier attempting to gain market share before traditional rivals can react or exit, and the customer facing so many new options yet fearful of not getting the “best deal.”

However, the critical observation is that the move to electronic markets is a one-time phenomenon. Just like the move to books and away from manuscripts was a one-time process (one that took less than 50 years to accomplish), so too is the current generation of workers faced with conversion to the electronic in similar historic proportions. Once done, issues of the predigitized world will have been displaced by those related to electronics and not solely to paper-based, physically planted economics.

You can expect three phases in the process. The first, the one we were always in, is the predigital market. Then, the one we are entering now, which is a combination of physical markets and electronic markets (e.g., buying and selling on the Internet). The electronic markets have much of the same look and feel of the physical markets (e.g., prices, terms and conditions). Electronic-based text looks like paper-based documents too, with pages and paragraphs. But a third phase will begin when electronic formats dominate the physical and paper. That phase will begin by looking like things from the past, but then, as we learned from experience with the digital, new ways of expression, new formats for presenting information, different value propositions, and new terms and conditions will emerge. Those will remain a partial mystery for some time, however.

But back to my basic point of why the conversion to the electronic is fundamentally a one-time event for management over the next couple of decades. The case to move is a compelling one. Second, we have seen this kind of historic shift

before and, thus, can begin to anticipate the nature of the move. Previous examples of a one-time shift include:

- From human muscle as energy to that of animals
- From animal muscle as energy to steam-driven machines
- From steam to gasoline and electrical motors
- From manuscripts to books

In each instance the move was essentially a one-time occurrence when the new form of energy or the new platform (to use an IT term) for information proved cheaper, faster, and more capable than the earlier one. In each situation, humankind experienced parallelism, often for considerable periods of time in the case of the various energy transitions, but minimally with information tools. But change they did. In each situation the new generated productivity increases over the old, on both the energy and information fronts. With both, people also enjoyed increased capacity and gained the ability to do things that could not be done before. It is a way to explain how over the long course of history humans could go from keeping warm by wearing an animal fur to heated condos, from storing their information in the form of drawings on cave walls to the massive collection of books and manuscripts at the British Library, and now to digital libraries on the Internet. The circumstances we face today are very similar again. The reasons for moving deeper into a digital world reflect those of past transitions.

The implications of our current transformation are enormous, today situated around problems of transition. Some of the obvious issues and problems one faces in a work setting include:

- Customers who are comfortable with the old ways. The most notable example is the desire to continue buying things in stores.
- Vendors who are also comfortable with the old ways. The operative examples include not leveraging the Internet or their preference to continue operating vertically integrated firms.

- New competitors arriving with no investments in the past or in buildings and inventories. These include all the new Internet-based companies, such as eBay.
- New sources of rapid wealth and poverty. Examples are the developers of Netscape who became millionaires, and mini-computer manufacturers who began to go out of business.
- People picking and choosing what to use and when. Buying a car online at midnight, while using software to find the best financing, rapidly becoming widely evident examples.
- Transitions while running with more than one option, finding it expensive and complicated. This is the circumstance faced by retail operators who are selling goods through stores and on the Internet at the same time. They sell at retail prices in brick and mortar operations but are forced to sell the same goods online for as much as 40 percent less.

These various parallel implications and issues of the transition were evident in different forms in earlier times. As the transitions were completed, they were replaced with new issues and implications that reflected the new realities. Those new circumstances in turn opened up vast new areas of opportunities and innovations. The move to the printed page in the 1500s, for example, created the publishing industry while also leading to the creation of the printed book.

Managers are asking several questions. What cost-effective supply chains or channels of distribution should be used, and when? How many lines of business should they have? What remains profitable from existing lines of business? They worry about the roles of scale and scope both in regard to investment commitments and market reach. We know today that those investments are very different in form and size from those of even such a recent time as the start of the 1990s. These investments are also tied to the larger issue of what products to offer and to what extent they are customized. There is also the most obvious, underlying risk of all, the actual move to a new order.

These questions and issues should sound familiar because, as Peter F. Drucker taught us a long time ago, some management issues are constantly present. The ones just listed fit his view because they came up in periods when other technologies arrived, such as the printing press, which moved information out of the hands of a few literate people (usually monks) to the mass public through publications. Such issues arose in both North America and western Europe in the nineteenth century as many new manufacturing technologies came online along with the simultaneous emergence of corporate capitalism. In this later period, the modern manager as a profession came into existence too. Specific answers to questions and resolution of issues, problems, and opportunities always varied because each period, each technology, and each market differed. The Internet, for example, does not behave like a printed page or a steam engine, hence the limits of over-specific historical analogy. But repeatable general patterns exist.

Now to the question of chips and the digital, the specific issues we face today. While this is not the place to conduct a tutorial on computer technology, a couple of very basic pieces of information are crucial to any understanding of the force of this twentieth-century invention. A computer chip is a one-inch-square (or smaller) device that has the capability of performing millions of transactions (think of them as calculations) in a fraction of a second, costs pennies to produce, and works at fantastic speeds. Also known as microchips, they have been around for some fifty years. They increase in speed, performance, and price/performance (answers per unit of cost) at the rate of about 20 percent or more per year. They are the “brains” of any device that acts with some intelligence, such as a computer, robot, airplane guidance system, or a programmed coffeemaker in your kitchen. In excess of 15 billion microchips had been made by early 1998; over a million U.S. workers are involved in their manufacture and sale, and almost a similar number around the world in other factories and nations.¹⁷

There are several features of this technology that influence what companies do today. First, in a very short period of time,

computer chips became the backbone of many automated and semi-automated business processes in almost every medium to large corporation and government agency in the world, even in underdeveloped nations. Second, they made possible the installation of multifunction telephone networks (e.g., call waiting, call traffic analysis, and call traffic load balancing). Most important with telephone networks, computer chips made it possible to convert these networks from mere voice transmission systems into the complex networks of today that allow us to display text and pictures, not just numbers, and ultimately, the availability of the Internet. Third, chip capacity made it possible to enhance man-machine interaction, which means one can use computers to work with customers or suppliers in a growing range of applications, such as automated voice response systems which we now use when we ask for telephone directory assistance or leave phone messages.

Another set of issues relates to the degree to which this technology has been deployed. It is absolutely correct to say that it is ubiquitous throughout the industrialized world and rapidly becoming so in less developed countries, thanks to cell phones and small appliances. Look at any middle-class home in Western Europe or in the United States and you find computer chips in such appliances as the microwave oven, in digital clocks, stereo equipment, in the washer and dryer (especially in Europe), compact disk players, refrigerators, toasters, bread makers, coffeemakers, telephone answering machines, telephones, cameras, VCRs, and portable tape recorders. An increasingly evident consequence is our growing familiarity with intelligent machines helping people move through the activities of their daily lives. More and more individuals are coming to understand and to be comfortable with what computer chips are doing for them. For another, chips (integrated circuits) are making it possible for humans to dictate to equipment (and hence to vendors of such equipment) what activities they want these machines and services to perform. Our power also extends to the speeds at which we want these tasks performed.

How long can this go on? In theory, for a long time, because whatever replaces the chip will have to do more. But let's look

at current technology's capabilities, and just be very tactical about the topic, leaving it to the technology writers to fantasize about some grand future. Researchers at the IBM Watson Research Labs, and others at what used to be called Bell Labs (now Lucent Technologies), say that existing physics and chip technologies can be exploited for increasing amounts of productivity (think of it as more answers and services out of a machine), at least through the first decade of the new century and probably beyond, without any fundamental changes.¹⁸ They and others also argue that the rate of increased productivity from these devices will continue at double-digit rates throughout this period. The result: continued deployment of chips into everything from automobiles to cans of beans. In fact, look at any major automobile manufacturer, such as GM or Volvo, and what they know and do, and you would be hard pressed not to think of them as computer companies. Dozens of chips go into each vehicle, and many more into their manufacturing and services machines. This process has been underway for nearly four decades with no sign of slowing down.¹⁹

The point is that the little chip affects what services one can provide, what a product looks like, how it is made, what it is used for and how, and who a vendor works with to reach the market. Increasingly, chips are making it possible for companies to add knowledge to a product, even intelligence, as a way of differentiating an offering from that of another supplier. Those who successfully make the transition to a digitally centric world (one characterized by e-business, not just e-commerce) are learning how to exploit this technology in whatever products and services they provide. They are learning to link together microprocessors, telecommunications, and information management into new value propositions.

All of this leads us to the fourth major feature of the changing nature of global business. Along with proliferating products, decline of physical markets, and expansion of commercial parallelisms, we have informationalization of products. A great deal of hype has surrounded this issue since the 1970s, first attributed to Alvin Toffler and his book *Future Shock*, and continuing through hundreds of studies and books

by professors, journalists, and social commentators. It is also the one subject most management and process teams think they understand best about this new network-centric economy. The key points are:

- Information about customers, products, and markets can be applied to make different products and create newer, better, more economically attractive services, often by shifting information to a customer so that he or she can do some of the work of selecting, self-selling, implementing, and using goods.
- For manufacturers, the ability to differentiate products by attaching information to them, or additional services, is a differentiator in an age when almost any competitor can build a reliable product at a competitive price.
- Applied information and knowledge can lead to incremental sources of income.
- Customers are demanding more information and training in use of products.

We see these elements at work all the time. Niche markets are more defined. Shipping a piece of software with built-in tutorials, finding incremental revenue through services, or offering recipes with food people buy are all early manifestations of the informationalization of products and services. A very early, paper-based example was the practice of soup manufacturers to print recipes for their products on the can's label (e.g., Campbell Soup in the United States).²⁰ In the next two chapters I explore the issue of computer chips in more places than ever by looking in greater detail at the role of best practices, knowledge workers, and the extent to which they produce value through insight, often underpinned by use of tools that have computer chips in them. But the important message to take away from this page is that many vendors are injecting information into or around their products and services, not simply into their internal processes and tasks. The role of information is becoming a major element in the construction of new value propositions.

POLITICAL REALITIES

Political considerations have always affected business and economic conditions. Business in general never thrives well in politically uncertain environments. Unstable political conditions in Russia make European and American corporations nervous about investing in the country, but because of political stability in China, pour billions into that nation. Ineffective political policies that cause inflation to surge and subside, as often occurred in Latin America during the last three decades of the twentieth century, kill business development. There is no reason to think that this situation will change. Political states have long been the most influential element in society in providing the kind of social and economic stability that nurtures business prosperity. To be sure, there are social and political commentators who argue that the political state is on a slow decline, to be replaced by some borderless federated environment. One has only to see how Iran is governed, observe the activities of military leaders in Africa or in Bosnia, or witness the painful transformation to a free economy in portions of the old Soviet Union to realize that such commentators were premature in their haste to announce the demise of the political state. Governments are not going away; their influence, both positive and negative, remains a crucial reality. Furthermore, governments and societies just do not change that quickly. They certainly will remain major realities throughout the life of every person working in business today, complete with political agendas, social turmoil, wars, and variations in economic policies. The whole issue of the role of the state is important because the degree to which businesses can operate in either the old or new economies, and the extent to which they can do their work, is profoundly affected by the activities and existence of political states.

Therefore, let's begin by recognizing a basic reality, namely, that governments and their supportive sectors within their societies will remain in place, regardless of what happens with computers, microprocessors, or the Internet. Having said that, however, there are patterns evident in society that reflect

some changes stimulated by technology. Some trends that are significant are both political and social. Parallelisms operate here too. Some nations are more democratic than others, societies vary in their approval of women in the workforce, some are more inclined toward open dissemination of information than their neighbors, and so forth. Even then, there are some emerging realities to contend with that have a global quality to them.

First, the world has generally moved into a period of representative government. This process began in the eighteenth century and has not yet fully played out. With the increase in various forms of democratic governments has come additional support for freedom of economic action for self-gain of the type evident in successful capitalist economies. In the past twenty years, all but one of Latin America's 21 governments have become representative in form.²¹ The Soviet Union's authoritarian government gave way to one clearly attempting to be more democratic. The fact that its various states are in a period of confusion, difficult transition, and even civil war, should not mislead one into thinking that big chunks of the European parts of the old Soviet Union necessarily reject democracy and capitalism. The American colonies went through a similar period of chaos during the years of the Confederation (1780s), and they turned out to be a strong, powerful nation—a result that would have been difficult to anticipate in that turbulent decade. Even China is compelled to leave well enough alone in Hong Kong and to encourage capitalist economic behavior in its eastern provinces. For businesses, that means fewer barriers to the free flow of information and a further opening of economic opportunities. It is also not outside the bounds of reality that democratic forms of government may give way to other regimes, as there are no guarantees.

But there will continue to be problems. Juan J. Linz and Alfred Stepan, two very distinguished political scientists who have done some of the most comprehensive analysis of the nature of both totalitarian and democratic regimes, have warned that a range of governmental structures will remain for a long period of time. While they are obvious in their acknowl-

edgment that “democracy legitimates the market,” they caution that not all of the old states of the Soviet Union, for example, will or can embrace democracy. “It is probable that in some of the countries we have analyzed democracy will never be consolidated. In other countries democracy might become consolidated but will eventually break down. We also unhappily acknowledge that some countries will consolidate democracy but will never deepen democracy in the spheres of gender equality, access to critical social services, inclusive citizenship, respect for human rights, and freedom of information.”²² They concluded their major study, *Problems of Democratic Transition and Consolidation*, by arguing that democracies do not have a monopoly on the best form of government.²³ The implications are clear: There are no political certainties, and the world is not necessarily going to be completely safe for business. There will be disruptions, risk to a firm’s access to markets, and there is no security in selling distantly via the Internet. As firms increasingly sell goods and services globally, they are going to have to know a great deal more political science than they did in the past.

Second, aggregate income levels have been rising in many parts of the world, although income gaps widened too. Most low-income states, the ones in which customers are least able to participate in the Information Age economy, still cluster in Africa, Central Asia and the Pacific, South Asia, and in four little states in the Americas (Guyana, Haiti, Honduras, and Nicaragua). Middle-income states, ones in which customers are now able to participate in a limited fashion in the emerging economy, are in East Asia, Europe, the Middle East, and the Americas. The richest nations in the world, already fully engaged in the Information Age economy, are primarily in Western Europe, North America, and partially in Asia/Pacific (Australia, Japan, New Zealand).²⁴ What this data indicates is that while more information-based, e-business-based commerce is possible around the world, it will not be universal, and there will be pockets of various capabilities to participate in this emerging economy. In short, generalizations about opportunity and execution are often misguided; assumptions based on the specific circumstances of region-by-region

remain a critical requirement. Opportunities will come online in new places over an extended period of time. The dream of selling every Chinese citizen a cell phone and a PC is just wishful thinking. However, selling Digital Economy products and services to several million Chinese members of the emerging middle class in East Asia is not.

Third, the number of potential customers is rising, although in what today we would argue are the poorest sections of the world. The wealthiest sectors are experiencing demographic stabilization, as populations reach zero or low growth, such as in North America and in Western Europe. The poorest, on the other hand, such as in Africa and Latin America, are surging with growth. India and China have implemented population control programs that are finally showing results. In the case of China, that trend will increase the average family's standard of living over the next quarter century. The same may happen to a lesser degree in parts of the Indian subcontinent, barring an unforeseen disaster, such as nuclear war or some medical catastrophe.²⁵ The implication is clear here too: Markets will appear within countries on the one hand, while on the other, products and services will have to decline in offering price for their demand to increase. Both represent opportunities and challenges to any firm attempting to participate in the global market.

So much for the big picture. What about values and social changes? I assume that most readers of this book are either American or Western European. The Americans understand their culture and how it functions in a free economy because it has been relatively stable, with no civil wars, massive internal migrations, or foreign invasions for a long time. However, OECD studies, among others, suggest Western and Central Europeans may not understand how much they have changed since World War II. A quick look at some of those changes suggest what they look like as they move toward a more unified Europe with a market of over 350 million customers in the immediate future, and possibly as many as 400 million if nations on the fringe of Europe participate. On many levels Western Europeans represent the model for the sorts of social changes underway in Central and Eastern Europe, to a lesser

extent in Latin America (especially in Brazil, Argentina, Chile, Peru, and usually Mexico), and in East Asia (particularly in Singapore, Hong Kong, Indonesia, South Korea, Malaysia, Thailand, and parts of China). The pattern I describe in the following pages also developed in the United States, but over the past century. What happened in Western Europe occurred within the second half of the twentieth century. One could expect, if the sociologists are right, to see similar patterns play out in Latin America and East Asia in shorter periods of time, but with local twists and turns caused by their different stages of economic development and by the differences of their cultures.²⁶ And we cannot forget the cautions put out by political scientists Linz and Stepan.

The critical changes can be seen with what happened in France, Germany, Italy, and Spain, involving the role of children, women, education, religion and politics. These changes were nothing less than profound. Changes in these five areas led to new values and lifestyles, reaffirmation of some old values, significant advancement of democracy and federalist politics, and an economic renaissance not seen since the late decades of the nineteenth century. This is not the place to explore in detail what happened in these countries; however, we can quickly summarize what occurred and what it means to business managers operating in a global economy.

The most profound transformation to occur was the internal migration from rural communities and agricultural sectors to industrial cities. In Italy, for example, between 1955 and 1971, over nine million people moved to large urban industrial centers from rural communities. That represented about 20 percent of the population. A similar story can be told of Spain, where people moved out of rural southern communities into large industrial cities. Barcelona exploded in growth. Similar massive patterns of migration were evident all over Europe. Every major industrial city expanded by more than a third in the last half century. These internal migrations broke up local economic patterns, snapped the iron control of older generations over the younger, and led to new life styles.

Between 1970 and 1990, women's civil liberties expanded. Women acquired the right to use birth control means, to own property, and to divorce in every Catholic country in Western Europe—all within one generation. The requirement that children stay in school increased by, on average, more than one additional year into their late teens. Every government made massive investments in education at all levels. Western Europe experienced the largest growth in university student populations in its history. In some universities, women dominated the student population. Social attitudes changed toward divorce, childrearing, careers, religion, education, and politics. At the risk of gross generalization, the move was liberal, modern, urban, urbane, and closer to what Americans, for example, look like in their large urban centers.²⁷

What do these enormous changes mean to businesses? The most fundamental implication is that nearly 75 million new consumers were created—people who have jobs, buy automobiles, refrigerators, manufactured clothing, watch televisions that they own, use cell phones, go out to dinner, buy groceries in stores, and are increasingly educated, urbane, and socially mobile. In short, a large group of new customers entered the market. That development occurred in a half century of enormous prosperity for Europe, a time in which many countries experienced annual economic growth of over four percent. The historically profound movement underway to create a unified Europe will play out first in the marketplace, not in politics (although it is the political that seems to get all the attention), creating a market even larger than the one that exists in North America. Anytime tens of millions of affluent customers can be added to potential markets, that is news. That is what has happened in Europe. Already the Internet is forcing unification as customers from across Europe buy goods online from vendors in many countries, soon paying for these with the Euro and using their Visa or Mastercard credit cards! This development has spawned all kinds of pseudo-official and governmental inquiries, from that of the German government to the European Union and OECD, to determine what public policies should be implemented. In short, the politicians are

being pushed along by a technological imperative over which they have so far had little influence, let alone control.

A second result is that as the standard of living goes up, these new customers can afford to buy more of the goods and services that make up the economy of the Information Age. Companies can sell and service this population in ways similar to what they are doing in other advanced economies, thereby improving their own economies of scale simultaneously with an increase in the potential pool of customers. Differences will remain, of course, reflecting local laws, practices, and languages, but the direction is clear and irreversible. What is particularly exciting about these developments in Europe is that they are extending eastward into Central Europe, through what used to be East Germany, Poland, both the Czech and Slovak republics, and, more slowly, into Hungary. Central Europe is to the Information Economy what Western Europe was to the Industrialized Economy in the early 1950s. It, too, will experience a rise in standard of living, internal migrations to sources of new jobs, and eventually its citizens will become customers for increasing amounts of Information Age economy products and services.

IMPLICATIONS AND ACTIONS

In this chapter I have argued that a new economic order is rapidly emerging, one that has a high digital technology content and nontechnical features as well. The new economy is evolving out of the more traditional industrial model of the past century, all occurring during a period of relative economic prosperity in the advanced economies. More customers, higher levels of education, expanded opportunities for women, and a greater ability to sell and service products on a global basis are the new reality. The Internet's influence, already significant, is about to become profound as the number of people who use it moves quickly from less than 200 million people to nearly a billion. This access is as profound a

change in human activity as any we have seen in the past 500 years; it makes everybody's short list.

Managers and employees of any enterprise at all levels from a clerk to a brand-new MBA to a seasoned CEO are, thus, being handed the opportunity to think of vast portions of the earth as their markets, an access that is as realistic and at least as convenient to reach as the ones they had before. In fact, and increasingly, firms are already doing just that—thinking globally—leading to new levels of scale and scope that will force some companies out of business because their markets remained just national. It will be a process similar to the one which occurred, for example, when national markets were created in the United States in the late nineteenth and early twentieth centuries, driving many regional companies out of business or to be absorbed by firms operating on a national scale. So what we have learned about scale and scope once again will have to be applied quickly over the next decade or more as effective participation moves from the national to the international. Problems of language, law, and local custom will have to be resolved. Mass customization techniques will help, so will some of the new business practices that are emerging. The Swiss company ABB's requirement that all its managers work in the English language is a harbinger of things coming as corporations strive to come up with global practices and policies, suggesting that there may be a further homogenization of business practices around the world. These will also have to work within the context of local cultures. Not everybody is an American or a Western European!

Technology will be the glue that holds many things together. Internationally imposed accounting practices, reporting business results via satellites, and using the Internet to communicate, perform, sell, and service are increasingly a new way of life. Companies will have to learn how to form economic alliances in multiple cultures and nations while identifying hot spots of economic opportunity, such as in East Asia (not all of China), portions of the old Soviet Union (not all 17 former republics), portions of South Africa (but not all of sub-Saharan Africa), and so forth. This change is more than Ford Motor or IBM designing products in one or more countries and building

them in several. That's cute and makes for good copy in advertisements and annual reports. The tough reality is that global firms need processes that allow them to service many markets with variations and nuances, not necessarily design products in many places. This is a shift that firms are going to make. While information technology will be the glue, we will not have the requirement of earlier times of having a profound knowledge of how IT works. That can be delegated to IT partners (e.g., telecommunications firms or large providers of hardware and software, many of whom already have effective outsourcing capabilities a company can contract). Thus, relying on the technologies that make globalized business possible, indeed essential for competitive scale and scope, increasingly will be less of a barrier than in the past.

This global challenge is not as difficult to meet as it might first appear. In large national economies many firms have learned how to build and operate enterprises that cover large geographic footprints populated with millions of people. Those mechanical tasks of business have to be taken to a higher level, but essentially many of the issues are the same. There is the very uncertain task ahead, however, of finding new value propositions, new ways to make a profit. That is new, and the answers will be found by taking three actions:

- Doing strategic planning well, followed by execution
- Understanding customers better than ever was done in the history of business
- Creating processes, policies, and practices that are efficient, timely, and effective

The uncertainty will be overcome, just as it was during the period when corporations and their national markets were created (1870s–1930s). Then, as now, the key investments in strategy, global reach, marketing, and industry and market knowledge will repeat what historian Alfred D. Chandler, Jr., has argued for over a half century in a shelfful of books: Those who make the investments win, and those who do it earliest remain winners the longest.²⁸

ENDNOTES

1. For example, Peter F. Drucker, *Managing in Turbulent Times* (New York: Harper & Row, 1980), Charles Handy, *The Age of Unreason* (Boston: Harvard Business School Press, 1989).

2. Often, the success of America was framed in the language of technological supremacy, with science the handmaiden of the practical. See, for example, Carrol Pursell, *The Machine in America: A Social History of Technology* (Baltimore: Johns Hopkins University Press, 1993).

3. Jonathan Hughes, *American Economic History* (Glenview, Ill.: Scott, Foresman and Company, 1997): 502–503, 517–525.

4. William J. Baumol, Sue Anne Batey Blackman, and Edward N. Wolff, *Productivity and American Leadership: The Long View* (Cambridge, MA: MIT Press, 1989): 143–159; see also James W. Cortada, *Info-America* (forthcoming).

5. A team of scholars has recently documented America's road to the Information Age, beginning with the 1700s, in Alfred D. Chandler, Jr. and James W. Cortada (eds.), *A Nation Transformed by Information: How Information Has Shaped the United States from Colonial Times to the Present* (New York: Oxford University Press, 2000).

6. A possible exception is music, which was noisy, but which also came into our lives in greater quantity thanks to such technological innovations as digital instruments and the Internet.

7. The U.S. Bureau of Labor Statistics did begin at the end of the 1990s to define this new economy, starting by describing classes of work and followed with measures of productivity.

8. Alan Stone, *How America Got On-Line: Politics, Markets, and the Revolution in Telecommunications* (Armonk, NY: M.E. Sharpe, 1997): 114–115; U.S. Department of Commerce, *The Emerging Digital Economy II* (Washington, D.C.: U.S. Government Printing Office, June 1999).

9. I have explored this in considerable detail in “Info-America: The Use of Information in Modern America” (forthcoming).

10. Leslie Kaufman, “Amazon to Remake Itself Into a Bazaar on the Internet,” *The New York Times*, September 30, 1999, Internet edition, <http://nytimes.com>.

11. Manuel Castells, "A new world is taking shape in this end of millennium. It originated in the historical coincidence, around the late 1960s and mid-1970s, of three independent processes: the information technology revolution; the economic crisis of both capitalism and statism, and their subsequent restructuring; and the blooming of cultural social movements, such as libertarianism, human rights, feminism, and environmentalism," *End of Millennium* (Oxford: Blackwell, 1998): 336.

12. Now well documented by Don Tapscott, *Growing Up Digital: The Rise of the Net Generation* (New York: McGraw-Hill, 1998), in which he argues that the children of the new millennium "grew up surrounded by digital media," p. 1.

13. Ibid., 4.

14. The notion of mass customization was most dramatically brought to our attention by B. Joseph Pine II, *Mass Customization: The New Frontier in Business Competition* (Boston: Harvard Business School Press, 1993).

15. Philip Evans and Thomas S. Wurster, *Blown to Bits: How the Economics of Information Transforms Strategy* (Boston: Harvard Business School, 2000): 150–152, 162–166.

16. Paco Underhill, *Why We Buy: The Science of Shopping* (New York: Simon & Schuster, 1999): 213–219.

17. Semiconductors are the building blocks of the Information Economy, a theme I explored in Alfred D. Chandler, Jr., and James W. Cortada (eds.), *A Nation Transformed by Information, How Information Has Shaped the United States from Colonial Times to the Present* (New York: Oxford University Press, 2000): 177–216.

18. Peter J. Denning and Robert M. Metcalfe (eds.), *Beyond Calculation: The Next Fifty Years of Computing* (New York: Springer-Verlag, 1997), is one of the most rational views of the future, collected by a group of distinguished technologists agreeing more often than not about where we are headed.

19. It is not uncommon today, for example, for a car's software (which is housed in these chips) to have 30,000 lines of instructions.

20. Stan Davis and Bill Davidson, *2020 Vision: Transform Your Business Today to Succeed in Tomorrow's Economy* (New York: Simon & Schuster, 1991): 52–85.

21. As of this writing (2000), the one holdout is Fidel Castro's Cuba.

22. Juan J. Linz and Alfred Stephan, *Problems of Democratic Transition and Consolidation* (Baltimore: Johns Hopkins University Press, 1996), first quote p. 435, second quote p. 457.

23. Ibid.

24. Based on World Bank data reproduced in Kenichi Ohmae, *The End of the National State: The Rise of Regional Economies* (New York: Free Press, 1995): 90–92.

25. Demographic considerations are often ignored by senior executives as they plan the futures of their firms. For an introduction to current trends and implications, see W.W. Rostow, *The Great Population Spike and After: Reflections on the 21st Century* (New York: Oxford University Press, 1998).

26. Paul Bairoch, *Economics and World History: Myths and Paradoxes* (Chicago: University of Chicago Press, 1993): 126–132, 167–168. The distinguished political scientist Samuel P. Huntington has recently begun to emphasize our need to understand the role of culture in global politics and economics. See, for example, his most recent book, *The Clash of Civilizations and the Remaking of World Order* (New York: Simon & Schuster, 1996).

27. These case studies are explained in detail in James N. Cortada and James W. Cortada, *Can Democracy Survive in Western Europe?* (Westport, Conn: Greenwood Press, 1996).

28. His books include *Strategy and Structure* (Cambridge, Mass.: MIT Press, 1962); *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass.: Harvard University Press, 1977); *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass.: Harvard University Press, 1990).

