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Human Resources: The Key to Canada-U.S. Competitiveness

*Anthony P. Carnevale**

Today, while focusing on work that we have done as an organization in the United States, I will talk about the human resource dimensions of the emerging competitive climate, the changing nature of the economy that all of us are beginning to live in and my sense of what that “new” economy is.

I will also talk about what I think that new economy looks like, and what I think its implications are for human resources and the unionization of people at work. I will focus on the skill issues with respect to human resources, but of course there are many other issues and I may touch on a few of those, given time and your own interests.

I will begin by distinguishing the new economy from the “old” economy. The old economy is still with us and co-exists, somewhat uncomfortably I would argue, alongside a whole new set of economic organizations.

That economy, arguably, began sometime around 1700 in Northern Europe. The Dutch were its first master, the first society capable of making things cheaper by utilizing either the same level of or fewer resources. That is, they were the first society to generate real productivity, and thereby become what really was, in those times, the world’s first industrial power. They had the capability to generate productivity, to make more things with the same or fewer resources, thereby enabling them to charge cheaper prices, extend their markets and build something of an economic base for themselves. They were the first masters of productivity in the old economy.

Around 1785, they were superseded by the British. British productivity (output per person) exceeded Dutch productivity, and the British became the industrial leader, retaining that title for quite some time (until about 1890, when the United States become the world’s productivity and industrial leader). We have retained that title ever since.

We began in somewhat of a fumbling way. America really had no industry to speak of, except for agriculture. We built the Springfield Armory factory to manufacture war implements to fight the British. But it was not until about 1801, literally the turn of the century, when a man named James Lowell, with a little larceny in his soul, went to Great Britain and stole the patent for an off-right loom used in making fabric and

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rough cloth. If he had been caught stealing that patent, ferreting it out of England, he would have been hanged. Such was the nature of the protection of knowledge back then. Intellectual property rights were protected by the gallows in those times.

He then returned to the United States and started to build a factory in Lowell, Massachusetts, his home, and in a place called Saco, Maine. Since both places had a high drop-off in their streams and rock-based rivers, the energy from the streams was fairly predictable. In 1805, he got very lucky. The United States was angry at the British for having treated them badly on the high seas and in various other places, and decided to place an embargo on British cloth. Suddenly, Lowell's cloth became very valuable. Most economic historians would argue that really was the beginning of American industry.

By 1890, we had exceeded British productivity rates, and essentially become the world's productivity leader. We still are, and that has not changed very much. If you look at American productivity rates, they still are the highest in the world. Our output per person virtually exceeds that of all other industrial nations depending on how you measure it, and how you use currency valuation. But that does not seem to be the point anymore. I feel that we have discovered in our interactions with American employers and the rest of the world, that the old economy, the industrial/mass production economy, the one that we essentially own in North America and brought into full voice during the post-World War II era, no longer competes well in this new economic environment.

Since our earliest evidence is from the early 1970s, when our productivity rates fell off, even though we were using the same methods to drive productivity that we always had, we were still good at driving down costs. We were still good at organizing work in a rational way, however that no longer seemed to be the trick to driving productivity or competitiveness.

Later, although our productivity exceeded the productivity of other nations in specific industries (i.e. chip production or textiles), we lost the market share. We lost the market share, not because we were unable to produce goods productively at a low cost in a highly rational way, but because we were unable to produce quality, variety or good customer service. Our chips were as cheap as anybody else's chips, but they were not as reliable. Our textiles were as cheap as anybody else's textiles, but we did not have the variety in textiles or the short production cycles that would enable us to produce a greater variety of textiles in short order, to connect us more closely to all our customers, whether they were the people who made apparel, or the people who bought the shirts.

In any event, something appeared to go awry in the early 1970s. The old economy appeared to be failing. Our initial instinct was to try to be more productive in most parts of the North American economy, and I would argue that it is still our instinct. That is, to be more productive by driving down costs. I think it is a healthy instinct, but a very small part

of the game. It is not the way to exclusively win anymore. There are competitive standards that now need to be paid attention to, other than productivity and low-price production.

Part of the problem we now face is that we extended those mass production industrial organizations to all other domains of our economic and private lives. We extended industrial thinking into agriculture and achieved enormous productivity. We also extended industrial organization and industrial thinking to service production to drive productivity up and allow us to produce services on a large scale. Without this we would not have large insurance companies, oversized government bureaucracies, and a separate set of institutions that produces services at relatively low prices for mass distribution.

The genius of the industrial/mass production system is familiar to all of us; we heard about it in our Economics 101 classes. The genius of the industrial system was to take some thing and break it down into its component pieces; to reduce it to its smallest pieces and dedicate machinery to each of those pieces in a very inflexible way. Thus, to make a different piece, a machine utilizing organizations with two or three different kinds of people, would be needed.

One sort of person was the white collar and technical elite employee sitting at the top of the organization; the managers, engineers, and college-educated work force in modern terms. Next, we had a larger work force sitting at the bottom of the mass production hierarchy who had relatively narrow skills matched to narrow-purpose machines. Lastly, we had another work force, sitting between the mass production worker and the white collar and technical elite; the craft or trade worker and the professional. This group performed functions that we could not industrialize, reduce or rationalize to the point where they required workers of less skilled and far more specific skills. We were always trying. For the trades person, the electrician, the plumber, the carpenter, the pipe-fitter, the doctor, the lawyer, and all of those professions, occupations and crafts in the service sector, we tried to create organizational formats by using of technology for well over 100 years. We have made some progress, again producing mass quantities and low prices.

In any event, we then organized workers into these organizational structures, which put the white collar and technical elites at the top, and carefully rationed jobs down the line. We had the white collar and technical elites take all the pieces of products and people and orchestrate them into a final product, using carefully timed and tailored production techniques. That is essentially the genius of mass production. It was a great success. Its day has not passed. We still need productivity in all our industries and endeavors. Moving beyond that, is one of the essential points of my talk here today.

The mass production system was used in sectors of the economy other than manufacturing. Its greatest success, perhaps, was in agriculture. The rationalization of agricultural production was probably the

greatest success of the industrial revolution oddly because it transferred manufacturing thinking into the agricultural system.

In any event, by the 1970s, the system was not performing well. By the 1980s, the system and its structure was, perhaps, inappropriate to modern competition. Today, we are trying to figure out what the next system is, and how to structure our organizations, people and technologies in ways that satisfy new competitive demands. The problems are deeper because the mass production system built a whole universe of infrastructure around it, and we have to reorganize that as well.

For instance, based on our discussion here today, mass production built a mass production education system. This mass production education system took knowledge and broke it down into its component pieces; took it out of an applied context where it did not have disciplines, where it was used in a fairly quick way to solve problems; broke it down into specific disciplines; took the disciplines and broke them down into competencies; took the competencies and broke them down into a sequence of learning experiences, which were usually locked up tight in a book somewhere that was then given to students and the education system. The students then read the books chapter by chapter and memorized the specific procedures that they needed to eventually master the discipline. At the end of each chapter, there was always an application section where we ran into the real world doing our arithmetic, geometry or trigonometry.

Most often we never did the applications at the end of the chapter, at least in the schools I went to. To the extent that we did do them, there was not much interest in them and the applications themselves were generally irrelevant to working life or to real world problems. My favorite has always been the one where the train starts from New York and the other train starts in San Francisco and you have to calculate when the two will crash into each other; which is practical knowledge for terrorists, not for people that need to work in the real world.

The other thing we did with the educational system was to build it as a competitive system among individuals. We gave very little opportunity for people to learn, to work with others, to solve problems or to develop applications in groups. We did very little to encourage a whole set of leadership abilities and group and personal skills that are necessary to succeed in using knowledge in real life.

As a result, when we evaluate education in the United States and Canada, we find again and again that young people know a great deal but they do not understand what they know at all. That is, young people know how to do mathematical operations. One recent assessment by the National Assessment of Educational Progress for the Educational Testing Service in Princeton, New Jersey, showed that when they assessed American students, about seventy-five to eighty percent of American students who graduated from high school had what they called intermediate competency in mathematics, which is about seventh grade. I would ar-

gue that is roughly enough to do most jobs in the modern American context. But what they also discovered was that those students scored very poorly on a whole series of other tests. The students knew how to do specific operations, but they did not know which operation was appropriate to the problem they were trying to solve. They also did not know when they used the operations and got the answer, whether the answer was correct or not. They had no sense of context, in terms of the outcome of their mathematical work.

My favorite example has nothing to do with math, but demonstrates that we do find the same to be true in historical subject matter. A very large proportion, although not a majority, thirty percent or so (which I thought was remarkable of high school graduates), know the names of Columbus' three ships: the Nina, the Pinta and the Santa Maria. However, none of them knew whose ships they were, why Columbus was using those ships or where he was going. Only about twenty to twenty-five percent could put the information in context.

Therefore, we built a mass production education system that does not encourage the applications of knowledge, treating it as something to be transferred, memorized and not used. In addition, to be consistent with the mass production education system, we created a social structure in schools separating the smart kids and the dumb kids. The modern context provides that the upper half of the high school class is college bound and everyone else basically provides some sort of mathematical distinction for the people in the upper half. Until recently, the kids who do not go on to college in the United States, and I would argue in most parts of North America, have received a relatively poor education. Moreover, they have received relatively poor social and applied skills as a result of their extracurricular and leadership activities in school. We built a system that gave us very high quality white collar and technical elites, and I think still gives us the best white collar and technical employees of the world.

I think our college educated managers, engineers and scientists are without peer in the industrial world. The difficulty is not in the mass production system, but rather that everyone else is not as good. That is only one of the organizational problems that we face outside of industry itself; there are many others. The relationships between industry and government based on a mass production model, especially a very successful one, were what we were all about. Our dealings with labor unions or governments were dividing up a growing pod; we were not working together to make the pea itself grow.

American labor walked away from the macroeconomics of internal decision making in the work place during the Red Scare of the 1950s. American labor decided that its basic function was to represent workers in terms of their ability to achieve wage increases, more positive working conditions, leaving the managerial decisions to the boss. Basically, extricating itself from the day-to-day operations of the institutions which its

people worked. Now, we are trying to jointly build management relationships in the other direction, so that we can utilize and organize workers in American institutions to contribute to productivity, not simply to bargain over the division of profit.

Much is the same with government. Government became a hostile, belligerent bargainer at the table with industry and labor, essentially bargaining for shares of the pie. In many cases, bargaining to force industry to do things that the public wanted it to do; for instance, clean up the environment, protect workers and so on.

A new kind of relationship is required among all these organizations. We do not really know how to build, not because we do not understand what this relationship looks like, but we are having difficulty moving from here to there. Building cooperative relationships is much more difficult than understanding what they are and how they ought to work.

In part, I would argue, since we have been so successful it is hard to give up old habits that have worked so well in the past. So, when an American or Canadian or any other modern industrial institution has trouble, it reaches for what it understands: authority; in terms of productivity increases, it reaches for cost cutting. There is comfort in knowing that such an agreement worked before, is easy to reinstate and will work again. It rarely does, except in the short term.

Let me now turn to what I think that new economy looks like. I will then answer the third question which is why this new economy came about. There seems to be a new economic system that is no longer based on mass production organization, whether in the work place or between work places, governments and labor unions. The new economic system is fundamentally different, primarily because the rules of the game have changed.

In the past if you could produce something at a low price and make it available to people then you won. Productivity was the standard for that economy. However, it is no longer the sole standard. It is the ante in the game, but there are now many other standards including quality. Quality has become the bully of the block for competition in the short span of ten to fifteen years. In the 1970s, I can remember attending numerous conferences trying to find out why American productivity was declining so precipitously. I never did figure it out.

Whole industries and careers were made on those conferences for about fifteen years. We were trying to decide why productivity had declined. It became the buzz word, the central issue of the 1970s in all political debate among opinion leaders. It superseded the prior issue, opportunity, in this country; that is, trying to integrate populations into the American main stream economic and social life. We suddenly became worried, not so much about how we were distributing the golden eggs, but rather the hen itself.

By the time we built a national award for excellence in work, we called it the Boldridge *Quality* Award, not the Boldridge *Productivity* Award. Productivity had slipped into second place. If you look at the standards for the Boldridge Award, named after American Secretary of Congress, they concern quality, more than productivity. They are not the classic standards for production or organization of work.

What do we mean by quality? It has never really been clear. My best definition might be called internal quality. Built-in quality is what the engineers talk about, which allows the product to work using state of the art technology. Another view of quality comes from the customer, which suggests its desirability.

American organizations, and I would argue, most industrial organizations, are much more aware of engineering quality because it fits into mass production. It gives white collar and technical elites a powerful role. We are still weak on customer quality and service, rather than on production. Here our competitors in Europe and especially in Asia are one step ahead of us, if not more.

In addition to quality, there are other standards including variety. Variety is everywhere. There used to be 10,000 items in a supermarket, now there are 25,000. There used to be relatively few magazines on a newsstand, now newsstands are the sizes of libraries. Magazines like *Life* and *Ms.* used to serve generic markets. These days they have essentially failed because their markets are too generic. *Ms.* magazine attempted to serve working women and failed because it was too generic. Today twelve to sixteen different magazines serve the many different kinds of working women. *Ms.* failed because it could not find a sufficiently specific audience. Everywhere you look there is greater variety in products. For instance, on the highway there used to be cars and trucks. Now there are cars, trucks, vans and a whole variety of each to suit the individual tastes of specific market segments.

Customization is another standard. It is really the first cousin to variety taken to the extreme. This means a manufacturer will customize one product to specific individual uses, services and very small market segments. This even happens in chip production, basic memory and computer powering. We are moving toward highly customized chips and other manufactured items. I would argue that customization in major industrial production, including cars, will be the next wave of international competition.

Another competitive standard in delivering a service is convenience. There are two kinds of conveniences. The first is built-in convenience which is the manufacture of a user friendly product. For instance, if you are driving a car, you do not want to reach into the back seat to turn on the radio, or bump knees when you get out. The other convenience is customer service and the relationship with the customer. I would argue this is in fairly short supply, at least in the American economy.

The final standard is competition based on time. It is the newest, and I think the most aggressively pursued of the standards. There are different ways to compete based on time. For example, taking an idea and putting it on the street in the form of a product or service faster than its creator; taking an idea from Harvard, a design group, or other elite members of an institution and turning it into a saleable product or service faster than anyone else.

By all accounts, we are not as good at this as a lot of our competitors. Italians take little more than a few months to go from the raw fiber material to the final piece of apparel. In the United States, technology assessments indicate that Americans take over a year from the chemical fiber to the final piece of clothing ready for wholesale and retail sale. The car industry is always mentioned in this regard. From design to the final product, the Japanese and others can produce a car in two to three years; however, it takes the United States four to five years. Depending on how the design and production cycles are measured, our cycles can run up to thirteen and fourteen years on the same basic model, while our competitors are producing three and four models in that same period of time.

This is only one of the competitive time dimensions. Once the first product is made, manufacturers then race to improve the product faster than others to retain or build market share. Incremental improvements must be made in the product, its quality and the efficiency with which it is produced. This includes research and development. Here we are not nearly as adept as our competitors. The classic case demonstrating the United States' inability in this area of time competition is the inception and production of the VCR. VCRs used to be nearly the size of this podium. Americans owned VCR technology, market share and sales. However, we did not do much to improve it. In the meantime, the Japanese took this massive piece of equipment, progressively down-sized it, and made it more user friendly. Eventually they had a large consumer market product, not merely professional and technical markets.

There are numerous examples of these processes whereby incremental improvements are quickly made to keep products "state of the art," at least from the customer's point of view. Companies are continually improving their products so that customers begin to sense that there are particular companies, and in some cases, particular nations that do make state of the art products even though the customer does not really know what state of the art is. However, the customer is always willing to bet that the Japanese have it in cars and consumer electronics.

Another related dimension of time competition is the development of new applications. Moving through the competitive cycle it is important to take the original idea and turn it into as many products and services as you can. This also requires a fair amount of research and development in organizations. These are the new competitive standards: productivity, quality, variety, customization, convenience and time.

Standards that our organizations and our societies are trying to meet and having some difficulty in doing so.

I have one point in terms of organizational structures. Think for a minute about what it takes to meet these competitive standards. Most of the development of new applications, improvements in products and quality occurs at the point of production, service, delivery and interface with the customer. This is where our talk-down industrial-type organizations, whether in government or private services or industry, are weakest. This is also where our work force is weakest. Therefore, we are very good at the top, getting the idea from Harvard and winning the Pulitzer Prize, but we are not very good at turning the idea into cash. The money is not in ideas; it is in products and in services. Obviously, ideas have value, but they have very little economic value until somebody does something with them.

Most of our organizations are ill-suited to implement employee learning in the organizations themselves to meet this competitive standard. We are having difficulty building the organizations for the work force that can do that. Understandably, it is not easy and it is not clear that we should follow anyone else's methods. We must find our own way to do it.

One factor that always comes up about this point, at least among people I have talked to in the process of doing this work over the past three or four years, is that people clearly want productivity and low prices. They want quality, variety, customization and convenience. They want state of the art products delivered at mass production prices. Who would not want this? Is it that people want this now and not before? Why is that demand now being made on economic organizations while it was not being made a thousand years ago, let alone twenty years ago? You could ask people living in caves if they wanted low prices, if they wanted quality, variety, customization, convenience at low prices, and they would say, "Sure."

I believe many things have changed the rules of the game. The most obvious one, at least from the economists' point of view, is that we have all become richer. We can afford quality, variety, customization, convenience and state of the art products and services. We all have more money in our pockets. In the United States, we have doubled our annual income between 1946 and 1972, from roughly \$13,000 per family to \$26,000. Incidentally, we have not done quite as well since then.

Since 1972, wages of American workers have been relatively flat. We have increased our family income, first, by putting more people to work in our families; our spouses and our children (on average one and a half children per family). After 1980, we increased our incomes by borrowing, allowing our governments to borrow, consuming government services without paying for them, allowing our organizations to borrow, reducing our savings rates, spending more of our income and increasing

consumer borrowing. Generating available cash for consumption by borrowing on cars, houses and durables of that sort.

In any event, we have received much in return. As we continue to become richer, so does the rest of the world, which is probably more important. At the end of World War II, most of the world earned twenty to twenty-five percent of North American income; they were eating about half the calories we were eating per day. They were in rough shape. By now, most of them earn up to eighty to eight-five percent of our family earnings. Some do better, like the Scandinavians. Some arguably do better or just about as well, like the Japanese. Some are gaining at a fairly rapid rate, Eastern Europe for instance. Others are far behind but moving fast. The Soviets earn about forty-five percent of American family income, a fairly substantial leap from the ten to fifteen percent they earned no less than fifteen years ago. The same is true for the Chinese.

Watching all of this drama in Europe, Eastern Europe and Asia in the past year on television news I was surprised that the people who are involved in the events are young and fairly well dressed. They do not look like the peasant classes that I remember seeing in the movies of the early post-war era. They are advanced consumers. China and the Soviet Union have become consumer nations, much the way we were a long time ago. This is the essence of their revolution. They demand more and their ability to buy is much greater. Currently, their governments and societies cannot produce enough products and services to satisfy them.

So, the rest of the world is catching up with us in terms of earnings capability, which has enormously increased the demand for products and services worldwide. This will continue until we can build a world economy, which I would argue, we do not yet have. We do not have rules and procedures, whether administered, regulated, or market based, that allow us to open up robust markets. The unmet demand for products and services is enormous. Our ability to access this demand depends largely on our willingness to generate effective procedures.

This leads us to a second development. The world economy has become globalized; more people got into the game. Suddenly, if you could not produce quality, variety, customization, convenience and state of the art products at mass production prices, someone else would. This someone else is either another organization or, more likely, another nation. Access to the markets in North America, Europe and other parts of the developed world is fairly easy especially with manufactured products. Basically, with globalization if you cannot do it, someone else will do it for you.

The third factor, which many people begin with, but I am less impressed by, is technology. We can have all the quality, variety, customization, convenience and state of the art products at mass production prices that we want, but without flexible, essentially computer-based and information-technology, we cannot produce. The ability to customize

the product and to make variations is rooted in the ability to use flexible technologies. Although Europe and Japan had flexibility long before we did, they were not using flexible technologies throughout the post-war years, but flexible procedures and processes.

We all recognize that computer-based machinery, whether in services or in production, can change varieties and production and customize services. We can use computer-based machinery to move quality to higher standards than we could with statistical process control and other essentially information-based devices. We can also use these technical capabilities to increase state of the art products and services.

So, without technology, we probably could not have done it. The debate over technology is the chicken and egg question. Did the demand to merge arise and then the technology came to meet it, or did the technology merge generating the demand? In the end, I don't think anyone can answer this question. Although I am biased, technology is generally more flexible than we are. We can most likely use technology in as many ways as we can think of. It does not advance us nearly as much as industrial technology did. We have more control over it. Therefore, basic elements have changed on us.

Finally, I will talk about time. Lately the value of human time has increased. Alternatively stated, we all have more money in our pocket, but less time to spend it. As a result, we demand high quality, state of the art products that work. We no longer care if something is simply cheap and available. Today, we expect more when we buy things. In many cases, we have lost time since we are so busy making money. We are working harder, and more of us are working.

So, looking at time changes, people have actually lost time. We are working more, and have less time for consumption. Let me provide you with some numbers: American males, in the last ten to fifteen years are working slightly less than they used to, actually about one half hour less per week. Women are working six hours more a week. If you look at the time we spend doing other things, we are spending less time eating, about one and a half to two hours a week less, both at home and outside the home. This probably means that we are either eating incorrectly, or we are all eating standing up.

There are other interesting aspects concerning the uses of time. In terms of housework, women are doing four hours less housework a week. Men are doing two hours more. If you add those two numbers, you discover that our houses are two hours dirtier than they used to be. In terms of free time, men have lost about five hours a week, and women have lost about seven hours. Incidentally, this pattern is very clear. When you look at social statistics, you discover that most of the change revolves around females and families. American women are working more and have less free time. They tend to work one shift on the job and another shift when they get home. It is fairly clear that much of the new consumption behavior is emanating from changes in the role of females,

and the structure of families. The demand for quality, variety, customization, convenience and state of the art products and services, reflects changes in our social structures, the value of our time and how much time we have.

Well, these are all of the changes and standards that I think have occurred. I will now turn to the implications for organizations, because you cannot talk about people without talking about the organizations in which they work.

There are two clear implications: First, people must have more skills, and second, more people must have more skills. The old structure of skills identified mostly in the white collar and technical elites, no longer works. Most of the new competitive standard requirements are down the line towards the point of production, towards the point of service, delivery and interface with the customer. This is the part of the American population that we have not trained or educated very well to take on these new competitive standards.

Also, everyone needs more skill. Clearly it takes more skill than old time religion, reading, writing and arithmetic to work nowadays. More of us are working with computer-based technology and software based, in part, on mathematics. More of us are reading manuals and work orders that change constantly. More of us are required to communicate by writing in a short, abbreviated fashion.

One difficulty is that we do not use these skills at work the way we are taught in school. Another difficulty, is that many of the skills we need are not taught anywhere. If we are to be responsible for quality, we may have the best technical skills in the world and still do shoddy work. We all know people like that. People must take responsibility for something other than their own work effort, including what happens in the work process up and down stream from them. This ability to take responsibility requires skills that are not taught in school which most of us gain from life experiences, and these skills are required of more workers.

Interpersonal skills become vital as machinery takes over more of the competitive, physical and mental tasks. More worker time is spent up and down the line, interacting with co-workers or with customers. We need inter-personal skills to do this.

Organizational skills are necessary to understand your organization and ensure quality. Workers need problem solving and creativity skills, because more of their time is spent handling exceptions. For instance, a bank customer wants a customized financial package. Today, the front-line customer service person is generally someone at the lower-end of the organization. This customer service person operates a piece of machinery, a computer of some kind, which has all of the services of the bank (which have multiplied by the dozens) inside. If functioning correctly, that customer service person is responsible for customizing a financial package for that individual consumer. The new customer service person

needs a whole set of problem solving creativity skills and inter-personal skills that were not required of the bank teller who sat passively behind a cage receiving information. This need for a whole new set of skills permeates almost every work setting. Since technology has given them more time, and new competitive standards demand that they have autonomy, modern workers require a whole new set of skills beyond those we traditionally teach in school.

There is a third set of implications for organizations. Organizations that are responsive and flexible, making the most of information technologies are essentially networks, not traditional organizations at all. These networks are not driven by work rules and authority, but by commonly understood and generally agreed upon goals and objectives fueled by information systems and information pools that are generally shared. These systems are implemented, not by organizational structure, but by work teams that tend to be down the line.

In manufacturing, the organizational shift to networks is represented by a general decentralization or flattening of huge hierarchies. More autonomy and resources are given to work teams at the points of production and interface with the customer. The organization is then integrated, because you cannot have a loose federation of autonomous people in an organization. This integration is accomplished by common sets of information and outcome standards. Managers spend less time managing work processes, more time facilitating work processes, looking at the work outcome. If the outcomes are unsatisfactory the managers intervene, not with a club, but with a helping hand. This is the literature of the day concerning leadership.

In any event, these structures are becoming less rigid, more decentralized, flatter and driven by outcome measures. These structures are replacing former big hierarchies. I think private industry is moving more rapidly along these lines, although it is still slow. Public organizations and large bureaucracies, are having a great deal of difficulty with this. Mostly because, in the public sector, we have never guaranteed outcomes; we have always measured the inputs for access to services. That is, we guarantee a certain number of years of schooling, but we do not guarantee education. We guarantee the right to a lawyer and due process in the criminal justice system, but we do not guarantee justice. We guarantee trash removal, but we do not guarantee that your garbage can will not be destroyed.

Outcome measures are difficult in the public sector because we traditionally guarantee access. In a sense, this was also the standard for the private sector. For example, access to a car, that is a cheap car that you can afford on credit. Now we want a car that works.

In any event, we are having some difficulty with outcome measures in the public sector, I would argue, for political reasons. We continually debate school reform much the same way in private industry, and attempt to drive resources and autonomy by service delivery into the class-

room. Then we want to run the organization by measuring the outcomes of teaching. This is how we integrate the system and guarantee standards.

We can delegate authority, autonomy and especially resources in the classroom to the teacher, but we are having difficulty measuring or getting people to agree to measure outcomes. This will be a long and difficult political struggle. I think in the end, however, we will measure our outcomes in the public sector.

Another organizational change is taking place in health care. Everyone is trying to build decentralized, flat organizations that push autonomy down to service delivery or production. When politicians hear this, their eyes get very big, and they say quite correctly, "We already have too much autonomy in this industry. It is already too centralized. It is grossly inefficient. It works in a very haphazard fashion. There is little connection here that allows for efficiency. What we need in our health care industries is more integration, more structure."

This is essentially the same process. We are using information-based technologies, outcome standards and a variety of similar procedures used in manufacturing to build networks in highly decentralized industries. By setting standards for fees and services in health care, we are beginning to build a new network that will operate more efficiently. The old network largely consisted of autonomists and independent entrepreneurs, both in hospitals and doctors' offices. And you see this everywhere. Health care organizations are centralizing and connecting to each other more than they used to, but it will take some time.

Next, housing and other forms of construction will integrate since they are highly decentralized industries. Whenever we build a house, we collect a group of people that are a pick-up team, go outdoors, buy materials and hand tools, and build a house. As one Japanese economist said to me, "There are 1,500 parts in a car and there are 1,500 parts in a house. There is no reason why you cannot build a house the same way you build a car." In the end, he is right. The Scandinavians and the Japanese, with less success in this particular case, are doing exactly that. In construction trades and other similar industries they are quite decentralized. I suspect we will more often see a manufacturing work force made up of technicians, repair people and white collar people who do the marketing and sales and design.

These are the basic changes in organizational structure in human resources with which I think we are all struggling. This new economy with its competitive standards, demands a combination of higher levels of human capital and machine capital. There will be a much higher value attached to learning, and we already see that. The best indicator of this is the workers returning to school.

In 1972, male school returns in the United States were about forty-two percent, female returns about thirty percent. After ten years in the

work force, males with a college education would earn forty-two percent more than those with merely a high school degree; females would earn thirty percent more. By the mid 1970s these percentages decreased. Male school returns fell thirty percent, female school returns twenty percent. Educators argued that there were too many well-educated people and not enough jobs.

After the 1981 recession, these percentages reversed their course. In 1989, males with four years of college and ten years of work experience made eighty-six percent more in terms of overall income than males with high school degrees. College-educated females earned more than sixty percent.

Both education returns and on-job trainees have grown astronomically. Educators now argue that these percentages increased because the baby boom entered the work force. We had an over-supply of educated people relative to demand. It is remarkable that education returns did not decrease any further. After the boom was integrated into the work force, the returns to education began to increase. Indeed, this new economy, as I would call it, has been demanding more skill from people during the post-war era, and this will continue to accelerate. Therefore, if you have children, tell them to stay in school. It is imperative that they receive a degree.

