Report for

The Greater Colorado Springs
Economic Development Corporation

Workforce Study Group

on

Labor Market Economics

11/28/94

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Summary

- Data indicates that **investment in primary education**, as opposed to higher education, offers the best value for the money, 14% vs 8%. (*The Economist,* 3/26/94, p. 86)
- However, **targeted and focused higher education and training which leverages previous training and experience**, should give a much higher return than higher education in general. Especially concentrate on making training available and affordable to supply workers for target industry growth sectors of the Colorado Springs Strategic Plan.
- Focus on **short-term re-employment training** needs because the "training-to-employment" lag can be sufficiently long that the cycle is difficult to manage. *(The Fifth Discipline*, p. 24)
- **Training for top management** of companies to reduce poor management and misguided product strategies (identified in *The Economist*, 3/12/94, p. 20, as problems training cannot overcome) **could give the greatest leverage of all**. Effective top management training would be in the areas of continuous improvement, TQM, learning organizations, marketing, etc.
- Concentrate on actions to **improve labor market efficiency** by keeping the unemployed in touch with the labor market (*The Economist*, 3/19/94, p. 83) and providing information to improve the efficiency and effectiveness of their job search and retraining decision-making.
- To promote industry and job growth, **support technology transfer and cultural change to assist companies in producing high-value-added goods using the most modern manufacturing processes while emphasizing continuous improvement.** (M.I.T. Commission on Industrial Productivity, Scientific American, 6/89, p. 39; *The Decline and Fall of the American Programmer*, p. 17; *Lean and Mean*, p. 212; A*merica and the New Economy*, p. 54).
- Colorado Springs can better **understand its workforce** composition, quality, & future needs:
  - to **improve the region's ability to meet company's workforce needs** by making current and future needs better known to education, training, and counseling sources.
  - to make workforce composition and quality, especially of its available workforce, known to relocating and expanding companies, to more effectively **encourage company expansion or relocation to Colorado Springs** because:
    - it appears that regional growth is largely influenced by migration, which in turn appears to be for reasons unrelated to pure economics (Muth, "Regional Supply-Side Economics"),
    - people are migrating Colorado Springs and want to stay here (Westech Statistics), and
    - the quality of the workforce is **the major** factor influencing company relocation and expansion. (Survey & Analysis of Site Selections & Group Moves: *Policies, Costs, & Trends*, Runzheimer International, 1991)
- Colorado Springs can support networks, information flows, and cooperation among companies, suppliers, customers, competitors, and workers to promote growth in a competitive world market. (America and the New Economy, p. 57)
- Colorado Springs must **retain, grow, and attract large companies** to create jobs because small- and medium-sized enterprises, though an important component of any region's economic base, are not the drivers of economic development. (*Lean and Mean*, p. 239)

Introduction

In evaluating Labor Market Economics relative to Colorado Springs, it quickly became apparent that Colorado Springs must work within a national and world context to optimize local labor market operation.

It also became apparent that targeted training, network support, improved counseling, or any other component of proposed solution will be incomplete if quality jobs are not available.

Note: Skimming the Table of Contents of this somewhat lengthy report can help a reader zero in on areas of interest without reading all the detailed backup information.

Job Elimination

.... jobs have been, and are being, cut at an incredible rate ....

- "From 1983 to 1993, Fortune 500 companies eliminated 4.7 million people from their payrolls, or one-quarter of their work force, said David Birch, president of Cognetics ..." GT 7/10/94
- "In the first quarter of 1994, ... these [multi-national] companies eliminated 192,572 jobs, or 3,106 every day -- mostly in the communications, aerospace, computer, transportation and retail industries. Many more jobs were eliminated by smaller companies." From "Engineers and Employment in the Global Economy: A View from Capitol Hill", by Edith Holleman, Counsel, Science, Space and Technology Committee, U.S. House of Representatives. 9/3/94
- "Despite the declared arrival of an economic recovery, job cuts in 1994 are running 18% ahead of the pace in 1993, when more than 615,000 U.S. job terminations were announced. Positions lost through layoffs are gone for good." GT 6/22/94, from the Chicago Tribune
- "According to a survey by the American Management Association, middle managers, who made up only 8% of the sampled workforce, accounted for about 19% of the job cuts." *The Economist*, 3/12/94, p.20
- "... even high-level jobs are no longer secure ... in the age of flexibility" *Lean and Mean*, p. 199

.... and there are powerful system incentives to continue cutting jobs ....

- "Nearly half (47%) of major U.S. companies cut staff from 7/92 to 6/93. ... The level of staff cutting averaged 10.4% per company, compared with 9.3% year earlier and 9.6% in the 1990-91 recession. ... Even financially healthy companies are starting to cut their staffs ... . Despite the nonstop news of layoffs, Wall Street is expecting relatively strong third quarter corporate profit growth. ... [A] market research firm says earnings ... are expected to grow 21.2% from a year ago." *Gazette Telegraph*, 9/24/93
- The result of job cut announcements:
  - stock price surges
  - the CEOs of 27 companies that laid off more than 10,000 workers since March of 1991 got pay increases of about 30% in 1993. *Gazette Telegraph*, ~ May 1994

.... as downsizing continues, some question whether the job cuts are giving the desired results ....

- "... a study for the Census Bureau's Center for Economic Study questions whether job cuts and improved productivity -- a key rationale for many restructurings -- necessarily go hand in hand. An analysis of productivity at 140,000 factories during the 1980s found that while 55% of gains came where the work force fell, the other 45% came at plants with growing employment." *Gazette Telegraph*, 7/10/94

.... all these job cuts have caused unemployment to rise is the last decade ....

- "In the late 1980s, 2.0% of Americans became newly unemployed each month; only 0.4% of Europeans were so unlucky." *The Economist*, 3/12/94, p.78

Unemployment relative to other countries

.... unemployment is typically understood to be higher in Europe than in Japan and the U.S., but data shows that rates of unemployment are not all that much different ....

		U.S.	Japan	Britain	France
Unemployment at end of 1993:	Official:	6.4%	2.9%	10.2%	12.0%
	"Effective":	9.3%	9.6%	12.8%	13.7%
	effective/official ratio:	1.453	3.310	1.255	1.142

Official unemployment only counts those who are actively seeking work. "Effective" unemployment includes "discouraged" & "involuntary part-time" workers (but not under-employed). Britain and France are much more efficient in counting all unemployment. ... from an *Amex Bank Review* analysis using BLS data and referenced in *The Economist*, 2/5/94, p. 25

- "America's harsh benefits system, which threatens the unemployed with poverty, and then delivers on the threat, is a crucial reason why America suffers less from unemployment in general, and from long-term unemployment in particular." *The Economist*, 3/12/94, p 78
- "In Europe you get unemployment insurance; in the US you get a low-wage, dead-end, part-time job." Economist Lester Thurow. *The Economist*, 3/19/94, p 27

Unemployment in Colorado Springs

.... the number of registered applicants at the Colorado Springs Job Service has fallen in the last 2 years by 6% (29,161 to 27,391), but "high end" unemployment is way up ....

- Registrants at the Colorado Springs Job Service in the professional, technical, and managerial (PTM) category are now 31% of the total registrants, which happens to also be a 31% increase (6,465 to 8,497) over the last 2 years (7/91-6/92 to 7/93-6/94). Job Service placement of PTM registrants is only 1%.

- .... the breakdown shows that the specific technical occupations most affected are related to electronics, software, and medical, but overall managerial occupations are the hardest hit ....

Data on registrants in the Colorado Springs Job Service system on 9/15-16/94

Rank	Number	Occupation and Breakdown within occupation
1	1,041	Electrical/Electronics Engineering Occupations
	684	Electronics Technician
	120	Electrical Engineer
	73	Electronics Engineer
	32	Electrical Test Engineer
	29	Electrical Technician
	16	Engineering Manager, Electronics
	12	Engineer of System Development
2	1,021	Occupations in Administrative Specializations, N.E.C. (not elsewhere classified)
	452	Manager, Office
	442	Administrative Assistant
	25	Manager, Data Processing
	23	Administrative Secretary
	19	Estimator
	15	Manager, Computer Operations
3	492	Miscellaneous Managers and Officials, N.E.C.
	123	Security Officer
	97	Management Trainee
	65	Manager, Department
	42	Consultant
	35	Project Director
	32	Program Manager
	26	Vice President
	17	Security Consultant
	12	Manager, Industrial Organization
	10	President
4	454	Occupations in Medicine and Health, N.E.C.
	177	Medical Assistant
	61	Licensed Nurse
	60	Dental Assistant
	31	Emergency Medical Technician
	24	Phlebotomist
5	443	Occupations in Systems Analysis and Programming
	120	Computer Programmer
	116	Systems Analyst

Rank	Number	Occupation and Breakdown within occupation
		97 Software Engineer
		76 Programmer - Analyst
		24 Programmer, Engineering and Scientific
6	437	Wholesale and Retail Trade Managers and Officials
7	386	Manufacturing Industry Managers and Officials
8	322	Service Industry Managers and Officials
9	320	Accountants, auditors, and Related Occupations
10	259	Personnel Administration Occupations
11	235	Occupations in Psychology
12	222	Finance, Insurance, and Real Estate Managers and Officials
13	216	Industrial Engineering Occupations
14	208	Purchasing Management Occupations
15	188	Occupations in Social and Welfare Work
16	172	Mechanical Engineering Occupations
17	169	Sales and Distribution Management Occupations

Growth of temporary and part-time employment

.... the ranks of temporary and part-time workers is growing ....

- "... 22% of employed Americans are either part-time or temporary workers." "... employment with temp agencies accounted for 15% of the new jobs in 1993 and 26% in 1992.

  The Economist, 3/19/94, p 27

- Contingency workers -- part-timers, temporaries and contract workers who lack full benefits and job security -- make up a greater part of the labor force, accounting for as many as 30 million workers. The number of mainly low-wage temporaries has tripled over the last dozen years. Denver Post, 9/5/94

.... and not because workers wanted to shift to temporary work ....

- "... since 1982, temporary employment in the U.S. has grown three times faster than employment as a whole. Between 1976 and 1990, the number of part-timers (those averaging <35 hours of waged employment per week ...), increased by 7% compared to a 2% growth of full-time workers ... ." "Moreover, this trend has come from an increase in "involuntary" part-time employment, not from an increase in voluntary part-time employment. Searches for explanations ... should therefore focus of the demand side of the labor market" ... "the decisions of managers." These developments have serious implications for personal well-being ... between 1979 and 1989, the share of the private sector workforce covered by pension plans fell from 50% to 43%, ... employee coverage by health insurance ... declined from 69% to 61%." "This growing division of the American workforce into those who are entitled to employee benefits and those who are not is ... truly a dark side of flexible production."

  Lean and Mean, p. 202 - 204

Wage Trends

..... the poor are getting poorer ....

- "Since 1989 median full-time earnings for workers aged 20 to 24 have fallen, in real terms, by 7%. *The Economist*, 3/19/94, p 27

- "More than 14 million Americans who work full-time - nearly one fifth of the workforce - earn wages below the poverty level for a family of four. That's up by 50% since 1979.
  Denver Post 9/5/94

- "The appearance in 1992 of three widely read technical documents published in prominent places, inside and outside the government, marked the convergence of assessments on the extent, if not the causes, of the phenomenon of secularly widening earnings inequality. ...

  "[A] report published by the Census Bureau on workers with low earnings [looked] at the roughly half of all people employed year-round and full-time. ... [This analysis] found 'a sharp increase over the past decade in the likelihood that a year-round, full-time worker (or a worker with a year-round full-time attachment to the labor force) will have annual earnings [below the poverty level for a four-person family]. In 1979, 7.8 million or 12.1% of all year-round, full-time workers had low annual earnings. By 1990, the number of year-round, full-time workers with low annual earnings was 14.4 million and the proportion was 18.0%.

  'Young workers have the highest likelihood of receiving low earnings ... but the rate has increased since 1979 for all age groups below 65 years of age .... The rate for persons with 1 or more years of college [also] rose from 6.2% to 10.5%.' "

  Lean and Mean p. 192: quote from U.S. Bureau of the Census, "Workers with Low Earnings: 1964 to 1990," *Current Populations Reports, Consumer Income*, series P-60, no. 178 (Washington, D.C.: U.S. Government Printing Office, March 1992) pp. 5, 8.

..... and the "middle" is hollowing out ....

- Second, "...[T]he Economic Policy Institute ... looked at *all* workers, not just those employed full-time and year round. [Using] the same data as had the government, and virtually identical methods of analysis. They concluded that, between 1979 and 1989, from one business cycle peak to another, the proportion of American workers earning hourly wages below the poverty line -- about $6.50 in 1991 purchasing power -- rose from 25.4% to 28.0%. Over the same decade, the fraction of the workforce earning three times the poverty line and above --- about $19.50 per hour -- rose from 7.3% to 8.7%."
  Lean and Mean, p. 192: quote from Lawrence Mishel and Jared Bernstein, *The State of Working America*, 1992 (Armonk, N.Y.: Sharpe, 1993), p. 146.

- "The third major milestone of 1992 was an exceptionally exhaustive review of the debate, published in the American Economic Association's ... *Journal of Economic Literature* ... by M.I.T.'s Frank Levy and Harvard's Richard Murnane, two well-known economists specializing in the study of work, education, and income. ... Levy and Murnane concluded ... that:

'1973 marked the end of rapid real earnings growth and the beginning of slower growth bordering on stagnation. 1979 marked the beginning of a sharp acceleration in the growth of earnings inequality, particularly among men.

'[Between] 1979 and 1989 ... the proportion of men earning more than $40,000 (in 1988 dollars) increased, while the proportion of men earning less than $20,000 increased as well. The combination of increased earnings inequality around a slow-growing average means that significant numbers of workers -- particularly younger less educated men -- now earn less than their counterparts of the mid-1960s.' *Lean and Mean,* p. 193: quote from Levy and Murnane, "U.S. Earnings Levels and Earnings Inequality: A review of Recent Trends and proposed Explanations," *Journal of Economic Literature* 30 (Sept. 1992), p. 1333

'[In other words, at least] the male annual earnings distribution has 'hollowed out,' leaving larger percentages of workers at the top and bottom of the distribution, and a smaller percentage in the middle. At least for men, it is now clear that there were fewer middle class jobs in the mid-1980s than a decade earlier." *Lean and Mean,* p. 193: quote from Ibid., p. 1371

- The federal Commission on the Future of Worker-Management Relations concluded that "the U.S. has seen 'a long term decline in the rate of growth of productivity,' which 'makes it difficult for Americans to enjoy rising standards of living and (limits) the feasible wages and benefits that firms can pay.' " Its findings:
  - "U.S. job growth has been significant in low-wage, low-productivity jobs, while good-paying manufacturing jobs -- and blue-collar wages -- have declined.
  - "The growth rate in pay for white-collar managers and professionals has accelerated. The country has become richer. But, the gap between rich and poor is widening. Real income, adjusted for inflation has stagnated or fallen for 80% of households over the last 2 decades.
  - "The continuing shift from labor-intensive to technology-dependent industry further widens this pay chasm, reducing lower-middle-class opportunities and raising barriers to higher education for their offspring. ... [because families do not have the resources to invest in their higher education]
  - There is increased job insecurity across the board, fewer people working full time continuously for a single employer, and high persistent unemployment for the less-skilled."

    Denver Post 9/5/94

.... this increasing wage inequality trend exists even within groups of people with the same education ....

- "There surely *was* a widening gap during the first half of the 1980s between college-educated workers and those who never progressed beyond high school. But ... this growing gap resulted primarily from a 'precipitous decline of wages among the non-college educated work force and not [from] any strong growth of the college wage.' And in any case, by 1987 -- well before the onset of the 1990 recession -- the absolute inflation-adjusted wages of even college graduates began to decline." *Lean and Mean,* p. 167: from Lawrence Mischel and Jared Bernstein, *The State of Working America*, 1992 (Armonk, N.Y: Sharpe, 1993)

"Moreover, as Harvard's Larry Katz ... reported, inequality has grown among even people with the *same* levels of education ... since 1970 there has been a 30% increase in such with-group

inequality -- a rise of stunning proportions." *Lean and Mean*, p. 194: from Lawrence Katz and Kevin Murphy, "Changes in Relative Wages, 1963-1987: Supply and Demand Factors," *Quarterly Journal of Economics* 107 (Feb. 1992): 35-78.

.... the explanation of the wage inequality is that there are segmented labor markets ("primary" and "secondary") which have continued into this era of "flexible" production ....

- "... a 'primary labor market' [is] dominated by large vertically integrated companies [operating] in markets relatively sheltered from foreign competition." The "secondary labor market" consists of "a world of smaller enterprises [act] as subcontractors to the big firms [and are] unsheltered from intense price competition." "When we characterize the prototypical business organization of the new eras as a lean and mean flexible firm, embedded within networks made up of partners and dependent suppliers ..., we are implicitly recognizing that the workforce in the new economy is ... being systematically divided into insiders and outsiders." *Lean and Mean*, p. 196

- Economists "have studied a matrix of 621 different combinations of industries and occupations, drawn from the 1980 Census. ... they have been able to distinguish, for example between the custodians working for the automobile industry, where they tend to be well paid, and custodians employed in the fast food restaurants, where they are not. [They found] that about half of all high-wage blue-collar workers in 1980 did *not* work in manufacturing, and that more than 2/3rds of all low-wage blue-collar workers were employed in services. This ability to finally break the false (but popular) identity between manufacturing and blue-collar work is a major achievement." *Lean and Mean*, p. 200

  "The application of ... cluster analysis to this 621-cell matrix has led to [identifying] a latent structure according to which jobs fall into one or another of six categories. The two categories whose jobs generally pay the highest wages, offer the greatest opportunities for on-the-job training, and so on are 'professional, managerial, and sales,' and 'public sector. The two categories that generally pay the lowest wages, and offer the fewest employee benefits are 'low-wage blue-collar' and 'contingent' (part-time, casual, part-year employment). Sandwiched in between the two categories consisting of 'routine white-collar' and 'high-wage blue-collar' jobs." "... earnings differentials by cluster, controlling for education and experience, increased in the 1980s." *Lean and Mean*, p. 201

.... because job losses will continue, the Dept. of Labor recommended in 1991 that support for the dislocated be expanded ....

- "As a community, we are challenged to redress the unequal benefits and burdens characteristic of the new economic environment. Those who benefit from technical change and free trade need to share their good fortune with those who are victims of machines and foreign competition. The employed majority will need to be sensitive to both the poor and the dislocated. A new social compact will be required. The development of such a compact will not be easy in a polity accustomed to responding to majority concerns. In the current political context, the dislocated employees are the forgotten constituency. They are neither an effective political majority nor a truly needy minority." *America and the New Economy*, p. 83

"The first step toward building a new social compact will be for Americans to recognize that ours is a society based on work. A job is the price of admission to this individualistic culture and participatory polity. People unable to find work eventually disappear from the community, drop out of the American political system, and fall into the underground economy. These same destructive processes are at work for both the poor and dislocated workers. The chronically poor tend to start out and end up at the bottom of the economic heap. Dislocated employees experience an economic loss that rarely results in persistent poverty, but probably involves an equal amount of suffering. In the case of dislocated employees, it's not so much where they land that hurts, it's how far they have to fall."

America and the New Economy, p. 83

The evolution of the reduction in the U.S.'s competitive advantage

[Note: This entire section is from a single, excellent source: *America and the New Economy*, by The American Society for Training and Development (1991) for the DoL under a JTPA grant. While just this one source was used to develop this section, the other references used for this report presented either concurring and consistent views.]

.... the large number of workers in America allowed us to reduce costs by using mass production machinery and unskilled labor, instead of skilled labor ....

- "The glut of American workers, especially as the baby boom entered the workforce in the 1960s, allowed American employers to substitute unskilled labor for more expensive human capital. ... In Europe, a strong craft tradition and a powerful left-wing political movement considerably reduced the employers' authority to hire, fire, and redesign work. In Japan, employers were forced to provide "lifetime employment" to blunt the more radical policies of a powerful Marxist labor movement ... . American employers were able to reduce costs by shedding skilled labor and substituting mass production machinery in combination with unskilled labor. In sharp contrast, the Europeans and Japanese were force to treat labor as a fixed cost of production and could not easily eliminate expensive skilled labor by substituting machinery and less skilled labor." p. 13

.... this allowed education in the U.S. to be not-so-good for those not going to college ....

- "The Europeans and Japanese also compensated for a lesser quantity and quality of human resources by devising ways to make more effective economic use of these resources. The U.S. was good at educating and utilizing white-collar and technical elites, but students who were not college bound received second-rate educations and were given relatively little responsibility or opportunity to develop on the job. This system was consistent with the mass production economy that employed white-collar and technical elites in responsible positions at the top of institutional hierarchies and relegated non-supervisory workers to narrow tasks at the bottom." p. 14

.... and, unfortunately, even for those going to college, American schooling has de-emphasized real-world, group, and interdisciplinary applications ....

- "The Europeans built elaborate apprenticeship structures that mixed work and learning. The

Japanese provided high-quality elementary and secondary education to both college- and non-college-bound students. In the workplace, employees and their representatives shared responsibility and authority in an evenhanded exchange among team members up and down the line. ... Our competitors ...[focused] scarce financial and intellectual resources on real-world questions. Product development and process innovations were emphasized over basic research, and applied learning was emphasized at school and at work. The European use of apprenticeship, the Japanese use of group processes in school, and the emphasis on problem-solving teams on the job in both Europe and Japan are obvious examples of this applied focus. In contrast, American schooling sequesters students form the real world, breaks disciplines down into component pieces, and demands that students commit fragments of knowledge to memory. Applications are reserved for pen-and-paper exercises at the back of the chapter. Interdisciplinary applications are rare, and applications in the context of working groups are even more rare. At work, new products, technologies, and work processes are installed from above and implemented below." p. 14

.... Recent globalization of the economy has assaulted a comfortable product development cycle ....

- "The spark that ultimately ignited global competition was the need to find new markets for mass-produced goods when existing markets became saturated. Increased productivity in combination with the natural cycles of boom and bust in domestic markets began to create persistent oversupply in the mid-1960s." p. 18

.... In the mid-20th century a large mass market and little competition allowed U.S. companies time to engineer production for the use of unskilled labor ....

- "Globalization seems to have shattered the 'product cycle,' a self-perpetuating hand-me-down process of international economic development that has been in place ... . The American market [where markets were the wealthiest and largest with the most financial capital] was the logical seedbed for the development of new technologies and products and, as a result the place where products were first developed and sold. Eventually, in every product line, the genius of mass production reduced production systems to simple tricks requiring a small cadre of elite white-collar and technical workers who managed relatively unskilled labor and standardized technology. Once simplified, mature production systems were passed on to less developed nations that could use simple technologies in combination with cheaper and less skilled labor. In the meantime, the U.S. moved on to the next wave of new technologies and products. A rising tide in the developed world eventually raised all boats worldwide and did so without disrupting American superiority in the economic pecking order." p. 18

.... but now American markets are no longer overwhelmingly larger than other markets ....

- "This comfortable cycle has broken down under the weight of the new economic reality. Development has made human and financial capital more available outside the U.S., and markets outside the U.S. have accrued sufficient wealth to drive new product demand. .... The Japanese market is now almost half the size of the American market and growing. As economic integration proceeds in Europe, market size, buying power, and per capita income there

and in the U.S. are becoming roughly equivalent.

.... and other countries have very successfully developed a "fast-follower" product strategy ....

- "The most profound assault on the international product cycle has come from a general breakdown in its sequential nature. Today, the nation that develops a new idea may not profit from it before handing it down to a lesser economic power. Technology is footloose. The quality of the indigenous human capital is increasingly equal worldwide. As a result, nations can step into the product cycle at any given point. Indeed it is often best to let others bear the cost of development and to focus resources on subsequent phases of the product cycle. **There is pride in invention, but there is money in developing products, making small improvements in efficiency and quality**, and developing new applications for existing technologies, products and services." p. 19.

.... This increased global competition has driven the need for "flexible" production ....

- "The impact of the globalization of economic competition has been profound and in some ways unexpected. At its simplest level, globalization has increased the intensity and nature of competition. In a world where supply [of generic goods] exceeds demand, the competitive importance of productivity and prices is reduced; quality, variety, customization, convenience, and timely delivery of state-of-the-art products and services become the competitive edge. In global markets, demand fragments, requiring competitors to tailor products and services to local tastes and needs. In addition, the complexity of, and distances involved in, global markets require increased service functions in order to deliver products and services." p. 18.

.... which requires flexible, skilled workers, because the increased speed of product development leaves little time to design and develop production processes to permit the use of unskilled workers ....

- "In the new economy, the need to make improvements continuously and quickly makes flexibility of workers and organizations essential in all phases of the economic cycle and at all levels of the organization. In the classic economic cycle, there is a tendency to require flexibility only from senior, white-collar, and technical personnel and only in the initial, innovative phase of the economic cycle. In successive stages of the cycle, the ratchet of specialization tightens to reduce costs and increase the scale of identical outputs. In the new economy, however, it is becoming clear that a labor force segmented into broadly skilled elites and narrowly skilled non-supervisory employees and a top-down organizational hierarchy can result in costly delays in installing innovations, improving them incrementally, developing new applications for original ideas, and capturing and using learning to encourage breakthroughs." p. 53
- "Economic cycles also seem to be speeding up. As mass markets have expanded, competition has become more global and intense. As a result, the cycle times have shortened, and employees at all levels need deep and broad skills and a reserve skill capacity beyond the requirements in their current jobs to handle the new challenges that come with accelerating economic

changes. The lean, narrowly skilled organization is unlikely to have the flexible resources to manage change." p. 53

.... A skilled workforce is necessary for continuous, incremental improvement, which has taken on an importance comparable to, if not exceeding, the initial major innovation ....

- "In the traditional economic cycle, innovation is a heroic process easily tracked by economic statistics and patent applications. Innovations are generated by white-collar and technical elites, who then design and install specialized machinery and narrowly skilled jobs to exploit these innovations. In the intensified competition characteristic of the new economy, however, inventing and installing major innovations is only the tip of the iceberg of change. Incremental improvement, a process of continuous learning invisible to conventional indices of economic change, has assumed a growing competitive importance. Moreover, the process of continuous learning involves the whole organization, not just white-collar and technical elites. ... The competitive emphasis on incremental innovation has turned on its head the traditional heroic view of innovation in the economic cycle." p. 54

Unemployment trends; causes of job loss and unemployment

.... Current major world changes are not job-creating events ....

- The major world changes are:
  - End of the cold war (we're all competing for the same jobs)
  - globalization of the economy (GATT & NAFTA)
  - advance of automation technology (CAD helps one engineer to do the work of 6 - 12)
  - advance of information technology (facilitates the elimination of a layer of management)
  - relentless restructuring / re-engineering (downsizing) of corporations

Edith Holleman on "Engineers and Employment in the Global Economy"

.... and long-term unemployment is also increasing ....

- "Even though unemployment has been falling, the proportion of long-term unemployed (those out of work for more than 6 months) has risen sharply. Defense cutbacks and other corporate layoffs compounded the effect of ... two trends which increase the number of long-term unemployed ...":
  - "Although many new jobs are in occupations that require high levels of education, more and more workers are non-white, have lower levels of education and skills, and suffer discrimination in hiring. So their natural rate of unemployment is higher."
  - "... structural change in the mix of American jobs is pushing the rate up. As goods-producing jobs have been lost, ... those who have been fired have not been able to use their skills in other kinds of work."

  These trends have led to a " 'natural' rate of unemployment (i.e., that consistent with a stable inflation rate) of over 6.5%," rather than earlier "wisdom that the 'natural' rate was 5.75%."

The Economist, 2/5/94, p. 25

.... indeed, current economic theory -- "modern equilibrium theory" -- sees unemployment as "natural" to the system, not just happening due to dislocations or "shocks" which might cause an economy to be out of equilibrium ....

- "Instead of seeing high unemployment as the consequence of certain kinds of mistake, and of the circumstances that might give rise to such mistakes, equilibrium theory sees it as something that can emerge from the underlying structure of the economy."

  Review of *Structural Slumps: The Modern Equilibrium Theory of Unemployment, Interest, and Assets*, Edmund Phelps, (Harvard University Press, 1994) in *The Economist*, 2/5/94, p 102

.... Whatever the underlying mechanism, it's advisable to minimize unemployment by addressing the causes ....

- " ... there are 'natural' obstacles that stop labour markets clearing. That is, the wage rate ... can get stuck above the level at which supply would equal demand."
  - Trade unions - "at its crudest, this theory portrays unions as monopoly suppliers of labour who raise wages above the competitive level ... to a monopolistic level." However, the article also notes "... that France, which has proportionately fewer trade-union members than any other industrial country, also has high unemployment."
  - Insiders against outsiders - "... insiders acquire skills that firms need. This makes it costly for employers to replace insiders with outsiders, who would need expensive training."
  - Imperfect information - "Employers are imperfectly informed about workers' abilities. Firms try to compensate for this by using wages to influence the quality of their workforces."
  - Poor education and training. *The Economist*, 3/19/94, p. 83.
  - Obstacles to labour mobility (which may be caused in turn by disincentives to the supply of rented housing or lack of information for job seekers)" *The Economist*, 3/19/94, p. 83

  Except as noted - *The Economist*, 2/26/94, p. 70-71

- "the pervasive presence of government"
  - Minimum wages - "... it is misguided for governments to try to protect the poor by forcing up wages." Minimum wages eliminate the jobs of too many of those they are supposed to help." (note: *The Economist* gives no weight in any discussions to 1) whether a low wage is a "living wage", whether a low wage might be an incentive to turn to crime as an alternative, or the cost to society of crime or 2) whether a low wage does not permit a family to give its children a good education.)
  - The tax wedge - the " 'wedge' between the labour costs that firms pay and the cash that workers take home. These taxes make workers less eager to work ..."
  - Welfare benefits - "Governments [paying] over-generous unemployment benefits."

  The Economist, 2/26/94, p. 70-71

- Long-term employment itself may be a cause for the persistence of high unemployment in Europe, ... "about half of its jobless have been out of work for over a year, compared with fewer than 10% in America." "Long-term joblessness ... clogs the market-clearing mechanism. The longer somebody is unemployed, the rustier his skills ..."

  The Economist, 2/26/94, p. 70-71

.... and making the labor market as efficient as possible ....

"... governments should concentrate on measures to improve the flexibility of the labour market ... emphasis should be on microeconomic (i.e., factors influencing market supply, demand, and equilibrium), not macroeconomic policy (i.e., macro = allowing inflation to rise)."

The Economist, 3/19/94, p 83

.... Note that the advance of technology and rising imports are not on the list above ... the stated reason is ....

- The fears of technological change and competition from low-wage countries are exaggerated.
  - "Behind the phobia about new technology lies the notion that the amount of output is fixed, and so more machines must mean fewer jobs. But the amount of output is not fixed. If new technology boosts productivity, it will reduce prices which, in turn will boost demand and so create new jobs to offset those lost to machines. In the long run therefore, new technology need not be job destroying. The snag is that the workers who lose their jobs to machines are often not equipped with the right skills needed for the new jobs."
  - Competition from low-wage countries "may hasten the decline of employment in basic manufacturing industries, but as poor countries grow richer by selling their widgets to rich ones, employment will expand in skill-intensive and service industries in which rich industrial countries are competitive." *The Economist*, 2/12/94, p 75

.... but others point out that the whole world is also competing for the skill-intensive jobs ....

- "The pell-mell rush of the world's nations into free-trade agreements, with their accompanying international joint ventures further weakens the connections of any corporation to the well-being of a specific country's economy. The bottom line controls everything. ... The end of the Cold War has only speeded up the process. There are no longer two competing, somewhat duplicative systems. We all compete for the same jobs.

  Edith Holleman on "Engineers and Employment in the Global Economy"

.... A lack of investment is noted to be one problem ....

- "Protectionists blame the slow rate at which American living standards have risen over the past decade on rising imports. The more likely cause was America's low investment and hence slow productivity growth. Rich countries will gain as a whole from increased trade with emerging economies. Average living standards will rise faster. What is also true, however, is that some groups of workers, unskilled ones in particular, will lose out. *The Economist*, 4/2/94, p 69

..... but even where there has been investment, the large numbers of follow-on jobs can be created outside the U.S. ....

- "After a $1B federal investment [in Sematech,] which did help recapture leadership for the U.S. in the semiconductor equipment manufacturing field, the GAO warned that a net job increase was not evident because of what it termed 'increasingly complex international business relationships.' That's a delicate way of saying that semiconductors continue to be manufactured in cheap labor markets because that is where the profit is."

  Edith Holleman on "Engineers andEmployment in the Global Economy"

..... and foreign countries are competing with low wages <u>and</u> high technology ....

- "Nissan, TI, and Xerox have state-of-the-art facilities in Aguascalientes, Mexico employing 10s of thousands of people ... most live in slums with 2 telephones for 20,000 people. The developed countries cannot maintain their standards of living if forced to compete with equally productive, but dramatically cheaper, Third World workers. What we have is a situation where the developed world is losing well-paying jobs that have supported a consuming middle class. The developing world is getting the "good" jobs, but they aren't middle-class jobs anymore and don't support much more than a subsistence lifestyle."

  Edith Holleman on "Engineers and Employment in the Global Economy"

.... even software engineers are considered to be in trouble ...

- "... look at computer programming ... . According to the August [1994] issue of <u>CPU</u>, IBM, Motorola and TI have production and research facilities in Bangalore, India; Oracle will soon put its fifth -- and largest -- R&D center in Bangalore. Apple is setting up a development and education project in the Ukraine which has <u>500,000</u> computer programmers. Apple will train them and assign programming tasks at 1/4 of the price of a US programmer. Their inventions -- like ours -- will be sold worldwide. This has to impact the job prospects of the average programmer." Reference: Edith Holleman on "Engineers and Employment in the Global Economy

- Edward Yourdon predicts that "The American programmer is about to share the fate of the dodo bird. By the end of the decade," he says, "I foresee massive unemployment among the ranks of American programmers, systems analysts, and software engineers. ... *international competition will put American programmers out of work, just as Japanese competition put American automobile workers out of work in the 1970's*." (p. 1) He thinks that when "we ... see large-scale evidence of programming productivity on a national basis ... we will see a reaffirmation of ... statistics indicating the possibility of a 10:1 variation in productivity. And I doubt the U.S. will be at the top of the spectrum ... ." (p. 6)

  Edward Yourdon, *The Decline and Fall of the American Programmer*

.... this might cause Colorado Springs to think twice about making software engineering a target sector ... unless a concurrent commitment is made to ensuring the local software industry is extremely efficient (see under "What's being, or should be, done) ....

Trends in the workplace

.... The nature of the job itself is changing rapidly ....

- "We used to read predictions that by [the year] 2000 everyone would work 30-hour weeks, and the rest would be leisure. But as we approach 2000 it seems more likely that half of us will be working 60-hour weeks and the rest of us will be unemployed."
  William Bridges, "The End of the Job", *Fortune*, 9/19/94, p 62

- "What's really disappearing is not a certain number of jobs, or jobs in certain industries, or even American jobs! What is disappearing is *the job itself*."
  William Bridges, "Why jobs as we know them are vanishing," *USA TODAY*, 12/21/93, p. 11A

Education and training

.... Labor markets are failing and driving down the demand for unskilled labor ....

- Richard Freeman, a professor at Harvard and director of the labour-economics program at the National Bureau of Economic research argues that both the European and American labor markets are failing. "The pressures driving down the demand for unskilled labour -- new technologies and ... international trade, are hardly likely to diminish over the coming years. ... coping with this trend can only grow more difficult in [the] future."
  The Economist, 3/12/94, p 78

- "Low skilled jobs are being destroyed remorselessly in the rich world by the forces of automation and globalization." It's sometimes said that the solution to the lack of low-skilled jobs is to "concentrate on improving the skills of the workforce" ... "since it frees all economies to exploit their comparative advantages in brains and brawn." Many groups are pushing this as the solution:
  - Employers - "who see it as a way of making the public pay some of their costs"
  - Trade unions - "who think apprenticeships push up the price of labour"
  - Free-marketeers - "helps sugar the pill of free trade"
  - Educators - "because it boosts the demand for their services"
  - Economists - "who see it as a way of replenishing and augmenting society's 'stock' of skills"
  - Interventionists - "because it preserves a role for state activism while avoiding the traps of protectionism (which penalizes consumers and lowers living standards), demand management (which leads to inflation), or specific subsidies (which institutionalize dependence on the state)." *The Economist*, 3/12/94, p. 19-20

.... There are hints that the highest leverage can be gained by
1) increased primary education ....

- Return on education/training
  - " ... the returns to primary education are significantly higher than the returns to secondary education, which are themselves higher than the returns to higher education. An important reason is expense: university education costs far more per student than secondary or primary

education." This trend is more dramatic for the poorest developing countries than for highly-developed countries. OECD [(Organization for Economic Coordination and Development)] country average return from primary education: 14%, secondary education: 10%, higher education 8% (Source: World Bank).

- "Studies that compared "academic or general" secondary education to "technical or vocational" secondary education found, on average, that returns to the first were higher -- 16% compared with 11%. Again, cost is the crucial thing: vocational education is far more expensive ..." *The Economist*, 3/26/94, p 85-86

.... and 2) training at the highest levels in corporations ....

- "Improved training is not the royal road to success in all places at all times."
  - "Highly skilled people are losing their jobs as firms "de-layer" middle management and as the federal government cuts its defense budget.
  - "**Heavy investment in training cannot compensate for poor management or misguided product strategies ..."** (bold emphasis added) *The Economist*, 3/12/94, p 78

.... While it's true that the value of a college education is increasing, ...

- " ... the wage premium [for] college graduates doubled during the 80's. Today they earn an average of 77% more than high-school graduates -- a gap that is widening relentlessly." *The Economist*, 3/19/94, p 27
- "... the 75% of Americans who do not graduate from college face a grim future of stagnant or falling real wages." *The Economist*, 3/19/94, p 27

.... even jobs for the well-educated are increasingly harder to find ....

- "... the number of bus drivers with college degrees has nearly doubled in the last 10 years. *The Economist*, 3/19/94, p 27
- Atmel reported that engineers are being hired for operator positions, because they cannot find engineering jobs. Workforce Study Group meeting, 6/22/94
- "Labor Secretary Reich says that all American workers need is more education preferably in technical fields. If 50% of our college graduates had science, math and engineering degrees, would they find high-paying jobs in their field? No. There would be too many of them. The *New Scientist* reported in June (6/13/94) that current science and engineering college graduates were having a hard time and should think about combining their degrees with study in law, business, public policy or communications so they could get a job." Edith Holleman on "Engineers and Employment in the Global Economy"

.... Even so, educational requirements are increasing for projected Colorado jobs ....

- Projected Colorado job requirements 1990 - 2000: Jobs that will require
  - a traditional four year college degree: +36%
  - one to three years of junior college/technical training: +50%

- a high school education -20%

Source: Colorado Commission on Higher Education 1993 from a 6/94 **Agenda 21** report

.... In this time of rapid change, even Germany's apprenticeship "dual" system [of half-time at school and half-time at a vocational-training college] is failing .... and change to this system as well may be necessary to address a changing global environment ....

- "Germany's vocational-training system has long been a principal reason for the country's economic success. It may now be coming to an end." ... Last year, for the first time, more people went to university than into [this] dual system ... and the number of pupils seeking places in the dual system is falling. ... The problem is that the system is failing to respond to changes in the workplace; ... students [find] they can increase their chances of getting a job through some other form of education. ... The dual system produces a surfeit of skilled blue-collar workers ... they [now] need workers with more sophisticated computer knowledge and the flexibility to switch from one kind of work to another. The dual [university & vocational] system does not provide these." Changes are being contemplated to allow dual-system apprentices (with additional education) to go to the university, but this "would have the effect of allowing almost everyone to go to university (only 27% now do). But if a high school diploma and a university education become the norm, it would spell the end of the dual system."

  The Economist, 8/20/94, p 44

.... However, interestingly, there is even opposition to training as a solution at all ....

- "Indeed, training can even be a royal road to ruin. For many organized workers, whether in the professions or on the shop floor, 'skills' are a convenient excuse for restricting the supply or labour and increasing their own wages." *The Economist*, 3/12/94, p.20

What's being, or should be, done

.... *The Economist* recommends free-trade, not protectionism, and coping with the worker dislocations ... though none of the methods are judged particularly effective ....

- "Demand in rich industrial economies will inevitably shift further away from low-skilled workers in favour of skilled workers. ... How should governments respond? The instinctive reaction ... is to call for trade barriers and subsidies ... . Yet, even if imports were completely to blame ..., protectionism would not be the correct remedy. ... By delaying restructuring, it would result in the creation of fewer jobs in more efficient industries. This leaves governments with three main options (all of which have drawbacks):"
  - "Increase the demand for unskilled labour -- by public-works and job subsidies, but they are unlikely to be a good use of taxpayers' money in the longer run."
  - Education and training -- but it may not be cost-effective "to upgrade the skills of a middle-aged worker with limited education? To put it crudely, as economists sometime have to, is it worth re-training such a worker if he has relatively few working years left in which to pay off the investment in his training? ... Some economists reckon that it may make more sense

to concentrate resources on new entrants to the labour force ... . That, however, will not solve today's unemployment problem." [Note the cost to society of this middle-aged worker not being able to support and educate his family is not considered.]

- Redistribute income. "A better way for governments to reduce inequalities could be through income supplements for the low-paid. The tricky part is to avoid eroding the incentive to work, which would create an unemployment trap. This demands that the rate of withdrawal of benefits as incomes rise must be gradual. But that would make the scheme an expensive one."

.... and because there will be winners and losers, even *The Economist* notes it's necessary to address the job inequalities to resist protectionism ....

- "It is clear that free trade with low-wage countries will make some workers in rich countries worse off. Others, however will enjoy even bigger gains. The challenge for governments is to decide how to tax some of those gains to compensate the losers, through some combination of training and state hand-outs. A case can be made that it is only by addressing domestic income and job inequalities head-on that rich-world governments will be able to resist mounting calls for higher trade barriers against the poor [countries]. The *Economist*, 4/2/94, p 69

.... But there's considerable debate relative to following a purely free trade approach ....

- "We should not become a Third world country ourselves by running a dual society of (1) low-wage jobs held by new immigrants and the unfortunate and (2) overpaid Wall Street, legal and CEO jobs. ... A recent meeting in Jackson Hole, Wyoming, of government officials, economists and other experts from industrialized countries concluded that the developed countries had only two choices: to keep their minimum wage low and below inflation growth to attract low-paying jobs for their citizens or to keep their income support benefits up with the resulting high unemployment rates of the European countries. Paul Krugman, described as a 'wunderkind' among academic economists, was at that conference. He recently wrote in *Foreign Policy* that 'it is obvious that something has gone wrong with the promise of economic growth' stimulated by technological gains. The paradox created is 'growing misery in the face of growing wealth.' Market forces, Krugman said, are increasingly pushing against income equity. I often wonder about the innate intelligence of economists. I could have told them that 5 years ago. Don't they understand supply and demand which is, after all, the underpinning of capitalism? What the economists are saying, ladies and gentlemen, is that free trade and technological advances are bringing us increasing income inequities and there is nothing we or our governments can do about it. I call that deliberately "Third Worlding" our own society. Perhaps if they untangled themselves from their rigid adherence to free-trade theories, they could come up with some more creative ideas."

  Edith Holleman on "Engineers and Employment in the Global Economy"

.... However, several analyses emphasize the need for investment in human resources ... in workers ... and, <u>perhaps more important, in management</u> ....

- Systematic Weaknesses in U.S. Industry
  - Outdated Strategies

  - v Overemphasis on mass production of standard commodity goods [i.e., must use technology to customize products for market niches]
  - v Technological parochialism [e.g., engineers assuming we don't have anything to learn from Europe or Japan]
- Neglect of Human Resources [i.e., treating labor as a variable cost of production (disposable workers), rather than a fixed cost of production to be invested in]
- Failures of Cooperation (within and among companies)
- Technological weaknesses in development and production [i.e., taking products to market and continuous improvement ... see ******* below]
- Government and industry working at cross-purposes
- Short time horizons

******* "American companies have often lagged behind their overseas competitors in exploiting the potential for continual improvement in the quality and reliability of products and processes. **The cumulative effect of successive incremental improvements in, and modifications of, established products and processes can be very large; it may even outpace efforts to achieve technological breakthroughs.**" (bold emphasis added)

Reference: M.I.T. Commission on Industrial Productivity, Scientific American, 6/89, p. 39

.... and this applies also to the software industry ....

- "Let's accept my premise for the moment: American software is developed at higher cost, less productively, and with less quality than that of several other countries. So what? Does this mean that Congress is going to awaken from its usual stupor one morning and declare a national software initiative? Hardly! Does it mean that the CEOs of the U.S. *Fortune* 500 companies will insist that their five-year capital expenditure budget include an item for investing in software productivity and quality? Maybe, but I doubt it. ... Obviously, there are some initiatives at the national level. ... But I doubt they will have much impact on "mainstream" American computing, because **the fundamental problem is more one of technology transfer and cultural change than of technology development**. Meanwhile we will have much to watch over the next few years as Japan's SIGMA Project reaches its conclusions and as similar projects in Europe, Brazil, Korea, and Singapore unfold. And we will also have to watch ... Russia and ... China ... ." pp. 17 - 18

He notes the need to move up the scale on the Software Engineering Institute's (SEI) Process Maturity Model to a Level 5. The model: 1. Initial with little formalization, 2. Repeatable, stable process, 3. Defined introduction process, 4. Managed with process measurements, 5. Optimized with continuous improvement. At Level 5 there "is **a formal emphasis on continuous, ongoing process improvement, based on** the **metrics** captured in level 4." (p. 83)

He notes that "Not many organizations are above a Level 1" and that for large organizations "with more than 100 software professionals, and especially those with more than 1000 .. it is reasonable to expect a period of 2 to 3 years between levels, that is, *a decade to go from level 1 to 5!*." (p. 85) (bold emphasis added)

Edward Yourdon, *The Decline and Fall of the American Programmer*

.... Indeed, our own experience and discussions with representatives of local companies is that technology transfer and cultural change are the fundamental problems. ....

.... The current administration's approach is to smooth the school to work, welfare to work, and work to work transitions ....

- Robert Reich, Secretary of Labor, plans to consolidate training into a system capable of helping all Americans to upgrade their skills ... and to smooth 3 transitions:
  - school to work
  - welfare to work - turn welfare as a bridge from one low-skilled job to another into a ladder
  - work to work

The Economist, 3/12/94, p. 19-20

.... To support industry, training needs are shifting to the "softer" social skills ....

- "Employees in the new economy need specialized competencies, but also more holistic skills such as self-management and interpersonal skills. ... the substitution of continuous processes and shared information for sequential work processes, the increasing overlay of roles and work assignments, and the increasing interaction with co-workers and customers all increase the importance of social interaction at work. ... As employees become more interdependent, the softer social skills become more important. The technical knowledge necessary to perform a task must be accompanied by the more complex capability for playing roles in the context of a group. The fundamental social skill is the ability to manage oneself. Self -esteem is the taproot to effective management, and self-loathing is the most fundamental impediment to successful interaction with others. Self-awareness is also critical to self-management. Employees need to understand their limits, ability to cope, and impact on others." Other abilities cited as important: goal-setting and self-motivation; communication including listening, speaking and writing; negotiation and teamwork; exercise of influence and leadership; intellectual and emotional flexibility necessary to adapt to change; the ability to learn.

America and the New Economy, p. 104 - 105

.... improving social skills is especially important to enable investigating problems and addressing change, but it may be much harder than improving technical skills ....

- "We are programmed to create defensive routines and cover them up with further defensive routines ... This programming occurs early in life. ... We are the carriers of defensive routines, and organizations are the hosts. Once organizations have been infected, they too become carriers." from C. Argyris, *Strategy, Change and Defensive Routines*

The Fifth Discipline, p. 249 - 251

.... the *SCANS Report for America 2000* covers the skills that work requires of schools. These skills are a combination of a three part "foundation" and five "competencies" ....

The Three-Part Foundation

- **Basic Skills**: Reads, writes, performs arithmetic and mathematical operations, listens and speaks
  A. *Reading* -- locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules
  B. *Writing* -- communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts
  C. *Arithmetic/Mathematics* -- performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques
  D. *Listening* -- receives, attends to interprets, and responds to verbal messages and other cues
  E. *Speaking* -- organizes ideas and communicates orally

- **Thinking skills**: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons
  A. *Creative Thinking* -- generates new ideas
  B. *Decision Making* -- specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative
  C. *Problem Solving* -- recognizes problems and devises and implements plan of action
  D. *Seeing Things in Mind's Eye* -- organizes, and processes symbols, pictures, graphs, objects, and other information
  E. *Know How to Learn* -- uses efficient learning techniques to acquire and apply new knowledge and skills
  F. *Reasoning* -- discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem

- **Personal Qualities**: Displays responsibility, self esteem, sociability, self-management and integrity and honesty
  A. *Responsibility* -- exerts a high level of effort and perseveres towards goal attainment
  B. *Self-Esteem* -- believes in own self-worth and maintains a positive view of self
  C. *Sociability* -- demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings
  D. *Self-Management* -- assesses self accurately, sets personal goals, monitors progress, and exhibits self-control
  E. *Integrity/Honesty* -- chooses ethical courses of action

The Five Competencies

- **Resources**: Identifies, organizes, plans and allocates resources
  A. *Time* -- Selects goal-relevant activities, ranks them, allocates time and prepares and follows schedules
  B. *Money* -- Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
  C. *Material and Facilities* -- Acquires, stores, allocates, and uses materials or space efficiently
  D. *Human Resources* -- Assesses skills and distributes work accordingly, evaluates performance and provides feedback

- **Interpersonal**: Works with others
  A. *Participates as Member of a Team* -- contributes to group effort
  B. *Teaches Others New Skills* -- helps others learn
  C. *Serves Clients/Customers* -- works to satisfy customers' expectations
  D. *Exercises Leadership* -- communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies
  E. *Negotiates* -- works toward agreements involving exchange of resources, resolves divergent interests
  F. *Works with Diversity* -- works well with men and women from diverse backgrounds

- **Information**: Acquires and uses information
  A. *Acquires and Evaluates Information* -- identifies need for data, obtains it from existing sources or creates it, and evaluates it relevance and accuracy
  B. *Organizes and Maintains Information* -- organizes, processes, and maintains written or computerized records and other forms of information in a systematic fashion
  C. *Interprets and Communicates Information* -- selects and analyzes information and communicates the results to other using oral, written, graphic, pictorial, or multi-media methods
  D. *Uses Computers to Process Information* -- employs computers to acquire, organize, analyze, and communicate information

- **Systems**: Understand complex inter-relationships
  A. *Understand Systems* -- knows how social, organizations, and technological systems work and operates effectively with them
  B. *Monitors and Corrects Performance* -- distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions
  C. *Improves or Designs Systems* -- suggests modifications to existing systems and develops new or alternative systems to improve performance

- **Technology**: Works with a variety of technologies
  A. *Selects Technology* -- chooses procedures, tools or equipment including computers and related technologies
  B. *Applies Technology to Task* -- Understands overall intent and proper procedures for setup and operation of equipment
  C. *Maintains and Troubleshoots Equipment* -- Prevents, identifies, or solves problems with equipment, including computers and other technologies

Source: *What Work Requires of Schools, A SCANS Report for America 2000,* The Secretary's Commission on Achieving Necessary Skills, U.S. Department of Labor, June 1991

.... to improve the school to work, welfare to work, and work to work transitions, make training programs targeted and short ....

- Focus on short-term re-employment training needs because the "training-to-employment" lag can be sufficiently long that the cycle is difficult to manage. The appropriate training response may be counter-intuitive. In *The Fifth Discipline,* Senge quotes Draper Kauffman, Jr. from *Systems 1: An Introduction to Systems Thinking*: "When a temporary oversupply of workers

develops in a particular field everyone talks about the big surplus and young people are steered away from the field. Within a few years, this creates a shortage, jobs go begging, and young people are frantically urged into the field -- which creates a surplus. Obviously, the best time to start training for a job is when people have been talking about a surplus for several years and few others are entering it. That way, you finish your training just as the shortage develops."

.... and keep the unemployed in touch with the labor market ....

- Use "active labour-market policies" ... to keep the unemployed "in touch with the labour market to ensure that the long-term unemployed compete for jobs ..."
  - placement services
  - training schemes
  - recruitment subsidies
  - temporary public-sector jobs

"Despite the fact that Sweden has high trade-union membership and hefty taxes (which should imply a high [unemployment]), such policies helped to keep its unemployment rate to 3% or less between 1950 and 1991. True the country's recent severe recession has raised its jobless rate to 8%. But to the extent that active labour-market policies help to minimize long-term joblessness, unemployment should fall faster in Sweden than in other countries as its economy recovers." *The Economist*, 2/26/94, p 71

.... Therefore focus on short-term training, leveraging previous worker experience .... especially concentrate on making training available and affordable to supply workers for target industry growth sectors of the Colorado Springs Strategic Plan ....

Encourage industry and job growth

.... But training, and keeping the unemployed in touch with the labor market, are not enough, if there are no jobs. It has been noted that our previous *de facto* industrial policy has been successful ....

- Stephen Appold, a Carnegie Mellon sociologist, notes that Silicon Valley is a construct of a small number of powerful institutions, and *not* a "cluster" to which independent firms were attracted by market forces. Harrison argues that the success of Silicon Valley was due to "two powerful institutions -- the U.S. Department of Defense and Stanford University -- arguably played the greatest role in transforming this region ... into a world center of microelectronics-based high-tech industry." *Lean and Mean*, p. 117

.... *The Economist* describes current government policy to stimulate growth by encouraging companies to use the most modern manufacturing processes....

- The Clinton administration sees "the role of industrial policy ... [as] not to protect declining industries, but to goad business into producing high-value-added goods using the most modern manufacturing processes." *The Economist*, 3/12/94, p. 19-20

.... Using this "high road" to competitiveness is extremely important for workers <u>and for company survival</u> ....

- "[T]he "low road" is outsourcing work to companies that use temporary and part-time workers who get low wages and little/no benefits ... what British economists Deakin and Wilkinson refer to as a "low productivity trap" where companies' "dependence upon undervalued labor provides a way by which inefficient producers and obsolete technologies can survive and compete. ... and the process may become viciously circular ... ." *Lean and Mean*, p. 212

.... because the "low road" does not exploit technical potential fully or exploit the flexible capabilities of technology. ....

- "In theory, the advance of information technologies permits employer institutions to operate effectively with small elite corps of white collar and technical employees and even smaller groups of workers who have been reduced to passive machine tenders monitored by video surveillance and computers. Such a strategy can speed up production or service delivery and reduce costs, thereby increasing productivity, and is consistent with the market demands and organizations structures of mass production. However, there is growing evidence that this strategy does not exploit technical potential fully and is inappropriate to the new competitive requirements." *America and the New Economy*, p. 98

  "The dynamics of automation is entirely different in the new economy than in mass production. Employers wedded to old habits of mind are tempted to deploy the new technology to reduce labor costs, not realizing the importance of the new competitive standards. These employers are competing in the old economy, not the new one in which flexible technologies are raising the ante on skill requirements. Generally, the new automation eliminates or subsumes repetitive intellectual tasks in much the same was previous mechanization eliminated or took over repetitive physical tasks. For every task surrendered, however, there are new responsibilities generated for exploiting the flexible capabilities of the technology. Moreover, the more flexible and powerful the machinery, the more employees, work teams and organizations must increase their skills to deploy it." *America and the New Economy*, p. 99

.... How does one encourage the "high road" to growth? ... not by focus on small-and medium-sized enterprises alone ... because they are not the drivers of the economic development process ....

- ... "claims about SMEs (small- and medium-sized enterprises) as the most important job generators and technology leaders in modern industrialized economies are exaggerated, at best, as have assertions about the competitive superiority of small firm-led industrial districts. ... such formations must be seen as special cases of, or as segments within, larger, more spatially extensive production networks governed by the general principle of *concentration without centralization*. Seen either as stand-alone entrepreneurial enterprises or as collections of locally oriented, socially embedded "competitive cooperators, SMEs are an important component of any region's economic base. It's just that we should not mistake them for being the drivers of the economic development process." *Lean and Mean*, p. 239

.... Echoing the report of the M.I.T. Commission on Industrial Productivity in 1989, the path to growth is public and private sector investment in technology, training, and technical assistance ....

- The key to attaining "the high road to economic growth and development" is "... a joining of the public and private sectors to provide ... the 'three Ts': *technology*, *training*, and *technical assistance*. As for the new network firms, the objective is to make lean organizations rather less mean." *Lean and Mean*, p. 245

.... In addition, there is a challenge to keep up with the competition ... and the competition is investing much more heavily than the U.S. ....

- A 1990 estimate by the Congressional Office of Technology Assessment shows that, "where the Japanese government spends perhaps $31 billion on technology extension and loans to smaller firms each year, all levels of government in this country ... probably spend no more than $50 million." *Lean and Mean*, p. 183

.... The bottom line nationally is a need for investment ....

- "Too many firms have been following a low-road path, especially in the United States. ... Yet Congress continues to oppose the pursuit of a long-term growth strategy led by public investment ... . But when public investment strikes out, that does not mean that the problems that led to advocating it magically disappear. However it is paid for, whatever the public-private mix, you cannot grow a company or an economy without the three Ts. Even -- perhaps especially -- in a world of network forms of industrial organization." *Lean and Mean*, p. 245

.... including supporting the growth of networks among firms, large and small. ....

- "As the new economy emerges, work structures are converging on a common institutional format of interdependent networks of people, work teams and organizations. Mass production institutions are turning networks to transform their top-down rigidity into more flexible organizational formats; service and craft institutions find themselves using networks to foster greater integration and the benefits of scale. ... The news in the new economy is the growing importance of effective networks. Organizations no longer compete as single institutions but as members of competitive networks. Global competition and the expansion of competitive standards demand stronger organizations linkages, and new communications and information technologies allow organizations to connect with one another and with their customers easily. *America and the New Economy*, p. 57

.... But, because of our society's emphasis on individualism and competition, networks are difficult to foster ....

- "American organizations have found it difficult to trade competition and adversarial relationships for more cooperative habits ... [because] our society is founded on individualism ... . The interested observer needn't travel far to find organizations where workers and suppliers are still viewed as costs to be reduced rather than assets to be developed. Indeed, much of the overall competitive improvement has come from the old-time religion -- downsizing and dollar

devaluation -- rather than more profound changes in organizational structures and attitudes.
America and the New Economy, p. 65

.... and we find it difficult to develop joint private & government cooperation because our educational and governmental institutions are not market driven. ....

- American networks are weakest in using assets outside the private economy to complement the competitive efforts of private networks. The nation's R&D, educational, and governmental infrastructures remain aloof from the competitive fray and are underutilized for private production and service delivery. Further, there is little internal pressure for our educational institutions or governments to change because they are not market driven."
America and the New Economy, p. 66

Encouraging employment security

.... Indeed, workers must also be market driven to maintain competitive skills .... and to increase their security, workers are advised to shift loyalty from employers to skill. ....

- "Institutions and employees that do not seek flexibility often have it forced on them. The pace of change in the world economy and the intensification of competition can dislodge even the most secure workers. At best, a worker can hope to work for one employer for a lifetime but cannot realistically expect to hold one job all those years. In fact, although some institutions can guarantee employment in the fast-paced new economy, other despite good intentions, cannot. Moreover, when dislocation does occur, it tends to affect whole industries, making job search particularly difficult for employees whose skills and experience are heavily invested in one job or one industry." *America and the New Economy*, p. 90

- "Perhaps there is employment security at the very core of institutional networks, yet the volatility of the new economy suggests that even these workers, as well as those at the periphery of institutions, are best advised to become more loyal to their skills and less loyal to individual employers. Happily as skill requirements become less job specific and more general, both skill and experience are becoming more transferable from one job to another. Also, as education and experience become more important in getting and keeping jobs, workers are valued less for organizational time in grade and loyalty."
America and the New Economy, p. 91

.... Fostering this flexible workforce will require a system geared to workers on the move ....

- "The new demands for flexible employees raise some troublesome complications. First, as skills become more generalized, individual employees will be more interchangeable and the bargaining power of individual workers may decline. The loss of bargaining power would likely be smallest among core workers and technical specialists and greatest among non-technical generalists. Peripheral workers would be more mobile but have less bargaining power than core workers. Nurses are a case in point. They are highly skilled and highly mobile but relatively interchangeable and vastly underpaid. ... Finally, if we are to have a truly flexible workforce, American workers will need a whole set of expensive new benefits geared to

workers on the move, including portable training, portable pensions, and portable family services like day care and parental leave." *America and the New Economy,* p. 91

.... Increasing the specialized, accredited skills of the region's workforce will increase the value of the region's flexible workers to industry. ....

- "Ultimately, because of the growing importance of skill and its general applicability across institutions, workers who pay attention to education, training, and work experience can increase their control over their working lives. **Skill, especially accredited skill, can provide employment security** in a particular industry or occupation, even if not in a particular job with a particular employer. Moreover, demography will favor workers who pay attention to skill development in school and work. As demographic trends lead to shortages of skilled workers, especially at entry level, employers will compete aggressively for skilled workers and build stronger relationships with part-timers, temporary workers, and suppliers of business services." (bold emphasis added) *America and the New Economy,* p. 91

Influencing regional growth

.... Analysis indicates that the supply of labor appears to drive regional growth ....

- Efforts to explain differential regional growth have dealt with both supply and demand. Does a region grow because of demand for labor or because of the supply of labor? (Note that this source is quite technical, difficult to read, and to condense ... beware ...)
  - One theory of differential changes in the demand for labor among regions is the "export base theory" -- that differential shifts in the demand for products produced and sold outside a region account for the growth of a region. The answer must be consistent with two important facts:
    - "... relative earnings of persons of given skills in different parts of the U.S. appear to have been remarkably constant. ... A believer in the export-base theory would attribute this constancy to a highly elastic supply curve of labor. ... [But] all evidence ... suggests that labor force participation and hours worked are relatively unresponsive to changes in wage rates. ... [So] a highly elastic regional supply curve would have to be the result of migration ... . [Of] empirical studies of migration, however, ... none ... give one much reason for believing that migration is highly responsive to earnings or income differences."
    - "... all industries on balance tend to grow at greater than national average rates in areas where total employment is rapidly growing. ... It is relatively easy to account for above average growth rates in most industries in areas of above average total growth if regional growth is supply-side determined, for increases in labor supply through migration would affect all industries simultaneously. [It is] much harder to account for the uniformity of growth rates across industries on the export-base theory." He goes on to explain that neither of the two ways one might account for the fact that employment in most or all manufacturing industries is rapidly growing in rapidly growing regions are satisfactory. "One is that the final demand for the output of all manufacturing industries has shifted favorably where employment is rapidly growing. ... [This] seems too improbable to consider seriously." " The other way to account for [this] is interindustry relationships. ... if inputs

tend to be purchased locally. [There are] too many instances [of the opposite] to believe that this is generally true."

- "Changes in employment, rather, must result from shifts in a region's labor supply function. Differential shifts in regional labor supply are by far the most likely to arise from migration. [Therefore,] **it is to the causes of migration**, not shifts in the demand for exportables, **that we should look for an explanation of [regional growth**, such as in] the sunbelt/snowbelt ... ."
  Richard Muth, "Regional Supply-Side Economics," Journal of Urban Economics, 29, (1991)

.... Therefore, because the labor supply is driven by migration and the Colorado Springs' region is one to which people are migrating, it's important to improve labor market efficiency and to improve the quality of the workforce. ....

.... Surveys of relocating companies reinforce the importance of the workforce quality ....

- " ... the majority of respondents (73%) feel that high quality workforce is [the most] important factor [influencing] the selection of a new location." Source: Survey & Analysis of Site Selections & Group Moves: *Policies, Costs, & Trends*, Runzheimer International (1991), p. A-16

.... This means Colorado Springs can understand the composition and quality of its workforce, especially of its available workforce, and make this known to relocating and expanding companies to encourage expansion in, or relocation to, Colorado Springs. ....

Support network formation and information flows

.... therefore improving industry networks and information flows in the labor market will result in positive benefits; that is, reducing barriers to, and promoting, job growth in the region ....

- Wheatley notes that she has "come to expect something useful occurs if [she] link[s] up people, units, or tasks, even though [she] cannot determine precise outcomes."
  Leadership and the New Science, p. 43

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