

ROLLER COASTER 2005

**A TIME TABLE FOR AMERICA'S TECHNO-ECONOMIC TRANSFORMATION
FROM LABOR-INTENSIVE TO INFORMATION-INTENSIVE
PRODUCTION AND MANAGEMENT**

1970 - 2020

compiled by

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*“The Future evolves in an orderly manner,
out of the realities of the past,
filtered and shaped by the decisions of the present.”*

*David Pearce Snyder
Consulting Futurist
1969*

OUR CURRENT MOMENT IN HISTORY

(A Brief Overview)

1945-1970

The first computer, ENIAC (1945-46) was a product of the Industrial Age. It was an *electro-mechanical* machine, weighing 30 tons, and employing tens of thousands of actual metal switches and vacuum tubes. Over the next 25 years, the electro-mechanical components of the industrial era ENIAC were replaced by transistors, integrated circuits and silicon chips. During this phase of their development, computers remained costly machines that were useful for only a few limited purposes, such as processing Census data or tax returns, or calculating the trajectories of missiles and moon shots, etc. Information technology (IT) had no measurable impact upon national economic performance during this *non-productive* phase of its development.

(NB In 1948, the U.S. joined 60 other nations in signing the General Agreement on Trade and Tariffs (GATT), committing the world's major commercial nations to adopt free trade as a means of assuring world peace through global economic inter-dependency. By 1960, U.S. imports soar, and large scale industrial layoffs begin as a result of rising foreign competition.)

1970-1995

By 1970, the first *electronic* computers had arrived. While general purpose, main-frame computers were still the size of a room, computers with specialized applications were only the size of a refrigerator. Word processors appeared in offices and robot controllers moved onto factory floors, quickly followed by the first desktops; Heathkits & Osbornes, then Apple and IBM. But the new, smaller computers were still immature technologies, expensive and unreliable, possessing limited capabilities with which neither management nor rank-and-file workers were sufficiently familiar to apply effectively. During the 1980s, IT flooded the workplace, especially in the U.S., where “supply side” tax incentives led businesses to invest \$1 trillion in immature IT products. Throughout this *counter-productive* phase of the Information Revolution, U.S. wages fell as national productivity improvement rates stagnated.

(NB As trade barriers fall, international competition intensifies. Unable to raise productivity, U.S. manufacturers cut costs to remain competitive, through mergers, downsizing and moving production overseas.)

1995-2020

By the mid-1990s, IT finally matured into a range of low-cost, easy-to-use, productivity-enhancing tools, including cell phones, interactive pagers, powerful cheap PCs and most important of all, the Internet, especially after it was endowed with color and graphics (i.e., the Web), in 1994. The powerful IT innovations of the **next** ten to fifteen years – including smart products and equipment, wireless broadband Internet access, Web-enabled video-phones, and groupware and conversational computing etc. – will sustain ongoing consumer demands for even more dramatic info-com capabilities. In the workplace, the “info-mation” of decision-critical data, plus the universal adoption of “peer-to-peer” (P2P) groupware, will not only raise per capita productivity across all sectors and levels of the economy, it will also accelerate restructuring – and lay-offs – at all large public and private institutions. The outsourcing revolution – made possible by the Internet -- will transform our vertically integrated hierarchical industrial era bureaucracies into delayered, networked collaborations, creating new patterns of employment that will make the typical 21st Century career much more dynamic, non-linear and “episodic” than the characteristic 20th Century career. During this final, *hyper-productive* phase of the Information Revolution, the U.S. Labor Department has projected that average household income will rise from \$43,500 p.a. in 2000 to \$70,000 p.a. by 2020. But they have not forecast how this happy outcome will be achieved. While economists uniformly expect the “information revolution” to create a new generation of high tech/high value adding jobs in the long-term, near-term (10 year) workplace trends show no sign of accelerating growth in high value employment, while short-term trends indicate that a shift toward low-pay, limited-benefit contingent work is continuing.

(**NB** As the info-structure” for information-based enterprise, the WorldWideWeb is accelerating the globalization of commerce made possible by GATT. As the Internet is integrated with our phone systems over the next 10 years, the Web will become the single electronic marketplace for information products and services serving the entire “global village,” driving labor markets around the world to pay “comparable wages for comparable information work.”)

Our moment in time

When a new technology reaches marketplace maturity, it becomes **both** hyper-productive **and** transformational, and it remains that way for a generation. Economic historians characterize techno-economic revolutions as “waves of creative destruction.” The changes and innovations of the past ten years have only been an “overture” . . . a prelude to a grand opera of truly dramatic change in how, where, and with whom we will all live, work and play . . . as well as how we will be educated, kept healthy and be governed, first in North America, and in quick succession, the other industrial nations and the developing nations of the world. And, because we will be the first nation to fully embrace IT at all levels of our society and economy, we will have to invent the new jobs, the new institutions, the new laws, programs and policies that will be required by the new realities made possible by technology.

The “9/11 Effect”

A fundamental tenet of long-term forecasting is that momentous events and towering personalities **do not alter** the long-term course of history. They **do**, however, tend to accelerate or retard rates of long-term economic, technologic and social change. For example, when the Business Cycle Dating Committee announced that the U.S. economy was in recession just 70 days after 9/11, the Committee were quick to point out that the Recession had begun in March, 2001, and that the terrorist attacks had merely accelerated the pre-existing consumer slow-down. Similarly, while 9/11 clearly precipitated a plunge in air travel, the decline in air passenger traffic that had been under way for a year prior to that, as a marketplace response to deteriorating quality of service and soaring ticket prices, coupled with a concomitant fall in the costs of video-conferencing. In much the same way, the anthrax attacks sped up the nation’s transition from paper mail to e-mail that was already well underway.

By themselves, the 9/11 attacks and the subsequent war on terrorism are unlikely to alter the long-term trajectory of the trends that are covered in the following pages. In fact, sales of cell-phones, broadband subscriptions and video-conferencing services have all increased dramatically since 9/11. While a number 9/11’s consequences are likely to take decades to play out, there is little question that the random terror that swept across the United States in the autumn of 2001 has accelerated the mass-market adoption of IT by American society and the American economy.

A CHRONOLOGY OF OUR CHANGING TIMES

A. ECONOMIC DE-STRUCTURING (1970 to the mid-1990s)

1. (1970-1995) – Economic growth and productivity improvement rates stagnate and average per capita wages decline 15% as the Nation passes through the counterproductive phase of the computer’s development; the income gap between rich and poor in America grows.
2. (1970-1995) – To supplement the declining income provided by their families’ primary wage-earners, millions of U.S. wives and mothers enter the workforce; the numbers of two-income families rise from one-third to nearly three-quarters of all households. While this adaptation effectively sustains existing levels of family income for a quarter-century, the resulting increase in the numbers of time-short families fuels a dramatic growth in consumer services, plus a rise in “absentee parenting,” leading to increased numbers of unattended minor children in America, with concomitant rises in drug abuse and teen pregnancy, and corresponding declines in K-12 school performance.
3. (1983-1993) – A \$1 trillion investment by U.S. employers in Information Technology (IT) fails to restore either our productivity improvement rates OR our prosperity.
4. (1980-1995) – Unable to improve productivity sufficiently to remain internationally competitive, U.S. manufacturers survive by cost-cutting – mergers, de-layering, off-shoring, etc. Millions of U.S. workers are terminated in mid-career or forced to retire early between 1979 and 1996.

B. INSTITUTIONAL RE-STRUCTURING (The Present)

5. (1995-2015) – In 1994, the message-transmitting capacity of the original narrow-band (slow speed) Internet was augmented by broadband (high speed) Internet, with the capacity to transmit graphics, data, color and sound, becoming the WorldWideWeb. Like the railways for the steam engine and the power grid for the electric dynamo, the Web became the infrastructure for hundreds of millions of free-standing computers, and ushered us into the hyper-productive, revolutionary phase of our transition from the industrial economy to the information economy. After having stagnated or fallen for 25 years, U.S. productivity and wages “took off” in 1995, and are currently

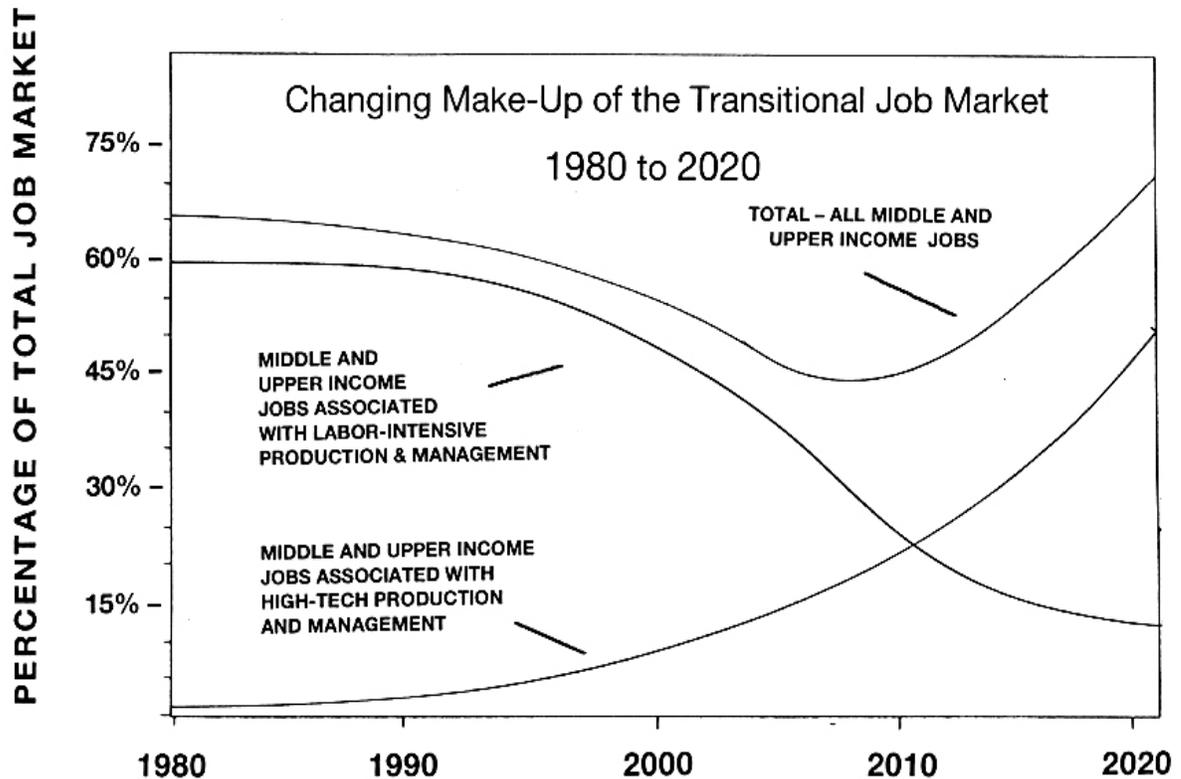
projected to rise through 2020. History shows that such temporary periods of diminished prosperity are characteristic of techno-economic revolutions. (See Graph, page 8).

6. (1995-2015) – The broadband (high speed) Internet will be singularly important to our sustained increase in productivity improvement. Without the Web, phrases like “cashless society” and “paperless workplace” were simply hyperbolic nonsense. With the Web, they are inevitabilities. The sudden increased capacity and decreased costs of communication made possible by our new Internet “info-structure” has already made possible the *out-sourcing revolution* that is currently disassembling the hierarchical, authoritarian, vertically-integrated bureaucracies by which we organized all large private and public sector enterprises in the industrial economy. It is now clear that the primary form of enterprise in the information economy will be “extra-preneurships;” flat, collaboration networks of authoritative partners, suppliers and franchisees whose separate special inputs will be “virtually integrated” via the Internet.

C. THE SOCIAL COSTS OF TECHNO-ECONOMIC TRANSFORMATION

(The Present)

7. (1995-2015) – Mature information technology drives continued improvement in productivity largely through the replacement of inefficient hierarchic bureaucracies with distributed networks of superior suppliers, services and franchisers. These hyper-productive extra-preneurships maintain stable prices for most consumer goods and services in spite of rising costs for basic commodities. However, ongoing mid-career terminations sustain continued large numbers of displaced, under-employed blue and white collar workers. In particular, direct labor will be squeezed out of information work – financing, banking, communications, insurance, administrative services, accounting, etc. – in the same manner that we have already squeezed most of the direct labor out of agriculture and manufacturing. Private, public and personal expenditures on job training and post-secondary, adult and continuing education will triple as millions of workers seek new skills to restore/maintain their employability.



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8. (1995 - 2015) – While the number of Americans of retirement age (55 years and older) will increase by over 50% between now and 2015 (see Figure 1, page 15), older workers will delay retirement as increased longevity prolongs their productive life-spans, and as economic restructuring increases income and pension uncertainties; 75% to 80% of Baby Boomers plan “to remain employed as long as possible.” Average age at time of retirement in the U.S. rose from 58 to 61 years between 1985 and 2001, and can be expected to rise to 67 by 2015.

9. (1995-2015) – Numbers of multi-income households remain high to serve as a social safety net to deal with the consequences of continuing layoffs and insufficient healthcare funding. The “Baby Boom Generation” becomes the “Sandwich Generation,” as their children return home after college while paying off their tuition loans (the “Boom-er-angers”), and the Boomers’ increasingly dependent aging parents begin to move in with their adult children at the same time.

D. THE “TRANS-MILLENNIUM” (The Near-Term Future – 2005-2015)

10. (1995 - 2020) – The “hyper-productive” stage of the Information Revolution is now well underway, as increasingly powerful, cheap, easy-to-use info-mated products and services pour into the workplace and the consumer markets, enriching (and complicating) our daily lives, while (most importantly) improving our productivity and prosperity.

11. (2005 - 2015) – While large-scale lay-offs from organizational restructuring will continue for much of the decade, successfully info-mated organizations will finally begin to create a new generation of high value-adding jobs throughout all sectors of the economy after 2005. The organizational restructuring of large, vertically-integrated corporate and public sector bureaucracies into flat, virtually-integrated collaborative networks will be largely completed between 2010 and 2015.

12. (2000 →) – While the Graph on page 7 suggests that America will achieve unparalleled, broadly-based prosperity by 2020, the Graph also clearly shows that the numbers of middle and upper income jobs in America **today** – as a share of ALL U.S. jobs – is at a 30-year low. We are currently in the “trough” of what Austro-American economist Joseph Schumpeter once famously labeled as an historic “wave of creative destruction,” caused because newly-mature workplace technologies are always used to improve the productivity/profitability of existing high value enterprises (an easy job) BEFORE the new technology is used to create NEW high value products, services and occupations. (A much tougher job!)

13. (2005 →) – So tough, in fact, that we have not yet begun to do it. While the Graph on page 7 – and ALL of the macro-economists -- anticipate an inexorable rise in the numbers of college degree-requiring median and upper income jobs in the years ahead, such jobs are not yet evident in the Bureau of Labor Statistics historically reliable 10-year job forecasts (<<bls.gov/EMP>>). Nor do such jobs appear in the long-term employment forecasts for the EU and Japan. An imminent rise in high tech-high value employment is commonly assumed by economic models; among macro-economists, it is an article of faith. BUT, it is by no means a rigorously forecastable economic certainty. We are still primarily in the “destructive” portion of Schumpeter’s ‘wave.’ We have only recently begun to invent the new post-industrial workplace.

14. (2005 →) – Between now and 2020, **all** industrial nations will be passing through this same techno-economic shift from labor-intensive to information-intensive production and management, with similar socio-economic consequences and socio-political turbulence. We are still only a relatively

short way into the “transformational phase” of the Information Revolution, during which the promoters of competing new technologies will fight titanic battles of mythic proportions with the defenders of established enterprise and technologies in the marketplace, in the courts and the legislatures.

The March of Globalization Continues

Macro-economists and merchant bankers uniformly expect productivity and prosperity to rise in the U.S. – and subsequently, worldwide – for the foreseeable future, driven primarily by the efficiencies of the Internet. As the other mature industrial economies transform themselves, they will become more challenging markets and more competent competitors for North American producers in a free-trade environment, sustaining pressure on domestic firms to keep prices down and to further improve their productivity through innovative applications of rapidly-maturing info-com technologies (IT).

In each job market that supplies untariffed international industries, a “comparable global wage” for comparable work will emerge worldwide. This will raise the wages for producers of freely traded goods and services in developing nations, while depressing the wages for comparable work in the mature industrial economies. To earn more than the comparable global wage, labor in developed nations will have to perform *incomparable work*, either in terms of their high productivity or the superior characteristics of the goods and services that they produce. *The seamless assimilation of mature IT – especially groupware -- throughout all production and learning will be essential to the ability of employees in mature industrial economies to perform incomparable, high value-adding work, well-paid work.*

We can, in fact, be reasonably certain that the pace of economic globalization will accelerate over the next 5 to 10 years, as the Internet becomes integrated with the worlds telephone systems via Web-enabled cellphones. Eventually all significant business entities on earth will have Web access by 2010-12. The Internet will become the single electronic marketplace for the global village. For information workers around the world, the Web will be the single level playing field where they all compete for employment. Unless American programmers, British actuaries and Japanese engineers are able to add special value to their services that their 2nd and 3rd World counterparts cannot, their future employment and compensation will increasingly be at risk.

E. AMERICA TRANSFORMED – BY 2015 . . .

15. Most large private and public enterprises will have outsourced their non-core operations and support functions. (see EXHIBIT 1, page 16.) As a result, the average big business or large government agency will have roughly half as many permanent employees as it had in 1980.

16. Between 12% and 15% of all workers will be self-employed, (up from 6% in 2000), most of whom will work out of their homes, as will 25% of all salaried white collar workers (i.e. tele-commuters); the return of commercial production to the domestic sector will greatly strengthen the family as an institution.

17. To facilitate flexible, efficient production operations – and to accommodate employees’ personal circumstances and social obligations – over one-quarter of all U.S. jobs will be part-time, temporary or intermittent positions (i.e. contingent-workers), *millions of whom will be employed by national agencies (Kelly, Manpower, Express Personnel, etc.) who will become America’s largest employers, offering contract workers pro-rata pay and benefits commensurate to equivalent full-time employees, including training, health insurance and retirement plans. Unions will increasingly organize salaried professionals and part-time employees, and campaign for “minimum benefits” and a renewed “social contract.”*

18. There will be a large and growing number of “inter-modal” enterprises: i.e. private firms, non-profits and “non-governmental organizations” (NGOs), using combined public, private and contributed resources to perform specific public/community services both in the U.S. and worldwide, often with legislated mandates as replacements or alternatives to government agencies for overseeing business operations and enforcing environmental, consumer and worker protection regulations. ***Employment in the non-profit sector will grow faster than in either the for-profit or public sectors.***

19. As the labor requirements of most production operations shrink, individual employers will continue to migrate out of big cities and suburbs into small towns and rural areas in search of lower operating costs, fewer government regulations, and higher quality physical environment. Population will grow fastest in America’s micro-politan communities, towns with 10,000 to 50,000 citizens. Already home to 28+ million Americans (10% of all U.S. citizens), these 567 communities are found in rural areas nationwide.

20. While industrial work had steadily migrated out of center cities (1960-1995), some U.S. urban areas began to stage remarkable economic comebacks following their 35-year economic decline (1995 →). Downtowns across

America are once again becoming vibrant, culturally-diverse residential communities with tens of thousands of YUMPSies and middle-class households occupying millions of square feet of converted office and industrial buildings made redundant by the Information Revolution. (YUMPSies = Young Upwardly-Mobile Professional Singles; a new consumer demographic, has already arisen as a consequence of delayed marriage throughout the mature industrial economies. These prosperous young adults will be instrumental to the revitalization of older urban centers.) While the “urban renaissance” slowed in the wake of 9/11 and the 2001 Recession, a middle class return to center cities is likely to continue with the economy’s recovery, so long as the war on terrorism does not hit downtown USA again.

21. Through the Internet, homes, schools, businesses and public agencies will all be linked to information utilities, and decision-critical data will flow into the workplace and our daily lives the way electricity or water do now. The resulting ease of communications between individuals and institutions will not only revolutionize the relationship between employers and employees, but the relationships between vendors and consumers, doctors and patients, students and teachers, plus affinity groups and their members, and politicians and their constituents as well.

22. Information products and services – including hardware and software, scientific and technical data, communications, info-mation systems, education, art, music and entertainment, publishing, design and engineering and commercial consulting, etc. – will have become America’s principal commercial output and dominant export, generating over 2/3 of our GDP.

23. The information content of manufactured products – in the form of design, engineering, software, “smart” materials and microprocessors, etc. – will grow rapidly, dramatically increasing the utility, serviceability, durability and environmental sustainability of consumer goods and business equipment, while reducing the costs of maintenance and service for all machines and appliances. **Info-mation will also enable a growing share of industrial and agricultural production processes to become increasingly environmentally benign!**

24. The most important mass-market information technologies (IT) will be Web-enabled cell phones and devices that we currently call “Personal Digital Assistants” (PDA’s), although, by 2010, we will surely have invented a shorter, more appealing name for these universal tools (the Germans call them “Handies”). These hand-held devices will ultimately combine the features of cell-phones, interactive pagers, and voice-mail, plus a digital video-camera, a GPS locator, a TV receiver and a palm-top computer with wireless access to the Internet, capable of interfacing with on-line data bases, financial services,

expert systems, simulations and main-frame computing power. Beginning in 2005, secure credit card numbers will be programmed into cellphones and linked to the electronic funds transfer system, turning cellphones into “electronic wallets” that eliminate the need for people to actually carry their credit cards. Electronic wallets can also make wireless transactions with Net-connected parking meters, vending machines, toll booths, etc., reducing the need for cash.

25. In 2002, the number of laptops sold worldwide exceeded desk-top computer sales for the 1st time, and by 2010, Web-phones and PDAs will outnumber laptops; they will be carried by the vast majority of Americans – including students at all levels – and by most managerial, professional and technical workers around the World, plus Bedouin shepherds, Chinese coal miners and Hindu farmers. Over 2 billion people will have access to the Internet via smart-phones and PDA’s within 10 years. They will be the “automobiles” for the “information highway.”

26. Ten years from now, the most important new IT feature will be “conversational computing.” By 2010, most routine uses of computers for financial transactions and for answering common questions will be in the form of verbal exchanges with “veepers” – virtual personalities. By 2015, microprocessors will be equipped with genial personalities and a colloquial command of the user’s language – i.e., “personologies.” On the job and in our homes, we will increasingly be “chatting” with our computers, our automobiles and our appliances. People will begin to have dependent emotional relationships with their computers well before 2020. Personologies will gain special importance as “companions” to the solitary elderly, where they will prove effective in enhancing quality of life. Personologies will be left inheritances, and the legal rights of artificial personalities will be hotly contested in the courts.

F. THE TRANSFORMATION IS REALIZED – 2015 TO 2020

27. By 2015, the IT-mediated transformation of America’s 2 largest, least efficient industries – healthcare and education – will be well underway, reducing the costs and improving the performance of these crucial components of our national enterprise, leading to benefits throughout society and the economy.

28. By 2015, as the final step in the outsourcing revolution, large businesses will have begun to contract out their front-line production and service delivery operations directly to their rank-and-file workers, who collaborate with each

other over on-line open-innovation networks to continuously increase the quality and efficiency of their activities. Freed of costly management overhead, U.S. production workers prove highly competitive in the global marketplace, restoring middle-class incomes to broad swaths of U.S. employment.

29. With renewing prosperity, America will – as it has in the past – assimilate the current surge of immigrants; most large U.S. cities will have over 50% “minority” populations who will have substantially revitalized those urban economies.

30. By 2020, for the first time in the history of the nation, over ½ of all U.S. workers will be women. Fully ¼ of all gainful employment – including 1/3 of all information work – will take place in the home, by a mixture of salaried tele-commuters, contingent and contract workers, and the self-employed. In millions of households, the “living room” will be replaced by “the office.”

Now Entering the Future! Be Prepared for Change.

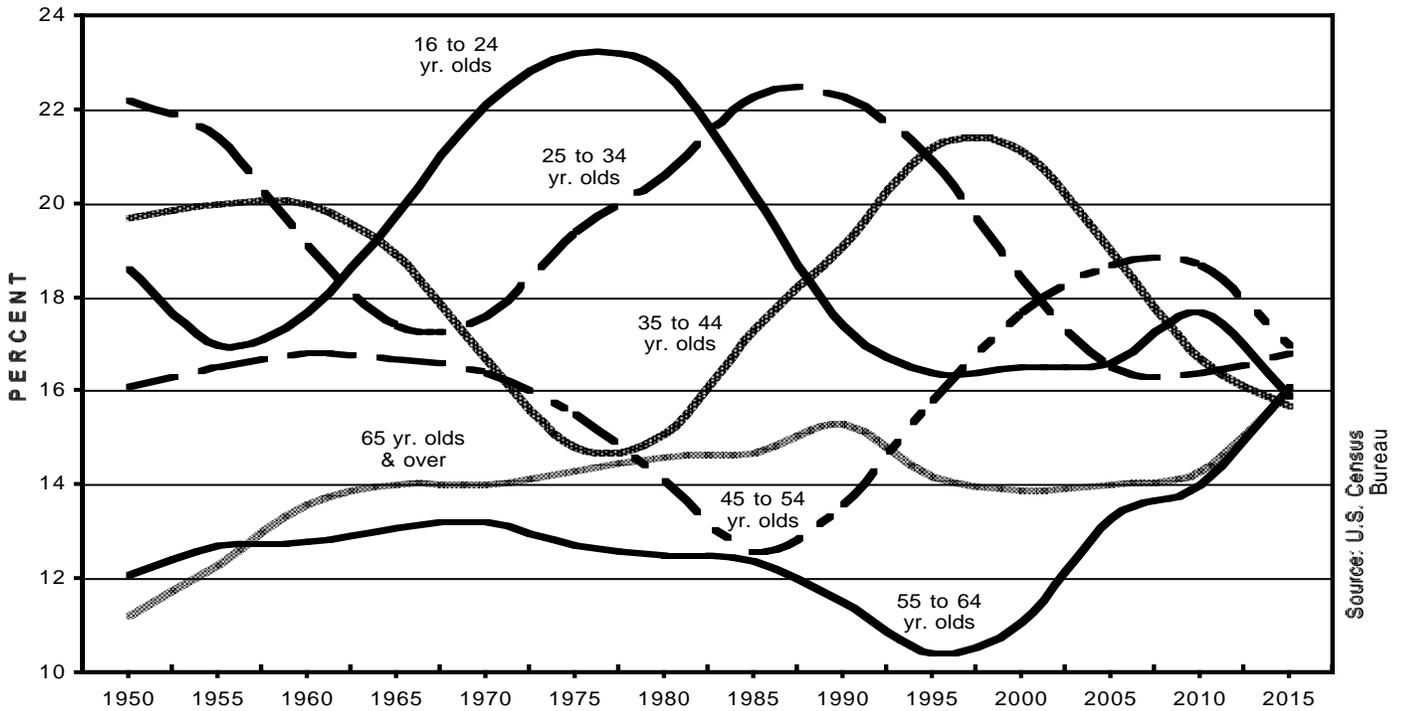
Dramatic, unpredictable political, financial, economic and scientific developments will predictably occur between now and 2020. (“Expect the unexpected!” has always been good advice.) While such random events may well accelerate or retard one or more of the benchmark phase-steps spelled-out in the preceding 30 paragraphs, they are unlikely to significantly alter the inertial evolution of the American enterprise described above.

The most problematical aspect of this Time Table is whether we will actually be able to use IT to permit large swaths of rank-and-file workers to add substantially more value than they do now, and if so, -- how. Six major scenarios for the future of employment in the U.S. and other mature industrial economies – published between 2000 and 2005 – were uniformly glum on the outlook for the middle class. (The scenarios are each briefly described in Exhibit 2, page 17.)

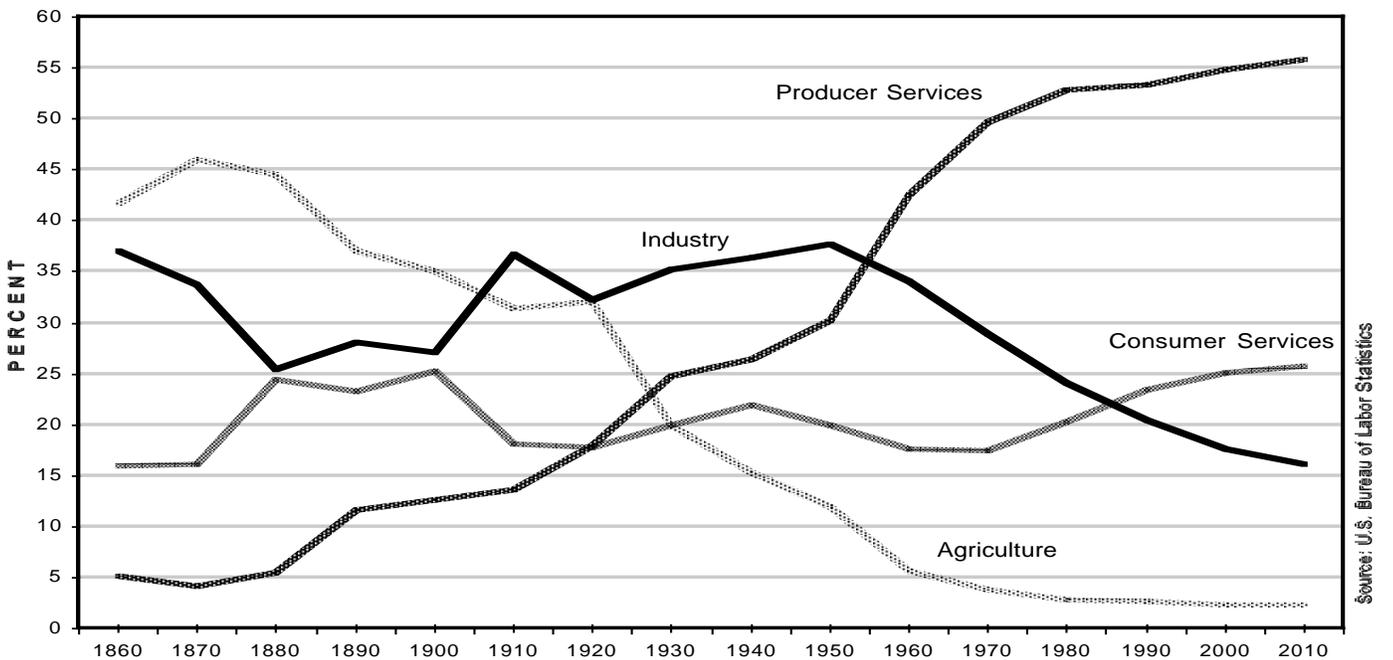
In his recently completed scenario for the future of work in America, based on emerging patterns of employment, David Pearce Snyder is considerably more up-beat. At the end of “Extra-preneurship: Re-Inventing Enterprise for the Information Age,” he concludes that “this isn’t going to be a ‘slam dunk,’ but a happy ending to our current circumstances is an absolutely doable deal.”

“Extra-preneurship: Re-Inventing Enterprise for the Information Age” appears in the July/August, 2005 issue of **The Futurist**. You may also download a copy from www.the-futurist.com.

(Fig. 1) AGE COMPOSITION OF THE U.S. ADULT POPULATION 1950-2015



(Fig. 2) FOUR SECTORS OF THE U.S. WORKFORCE 1860-2010



Staffing the Virtual Enterprise in 2015 (after 25 years of outsourcing & franchising).

% of total
Workforce

IN-HOUSE –

Core Functions/Competencies 35%

*Core Enterprise – Executives, Managerial,
Professional & Technical Leadership Cadre, R&D,
Operations/Production Personnel and Staff Functions*

OUT-SOURCED –

Complementary Functions/Competencies . . . 25%

*Component and Service Suppliers – HR Management,
IT Systems, Product Assembly, Franchises, Logistics,
Administrative Services, etc.*

CONTINGENT –

Commodity Competencies 25%

*Intermittent Employees – Part-Time, Temporary
& Flex-place*

SELF-EMPLOYED –

Special Competencies 15%

*Contract Consultants – Self-Employed
Professional/Technical/Hybrid Expertise, Creative
Producer Services, etc.*

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THE OUTLOOK FOR BUSINESS AND EMPLOYMENT 2005 TO 2015

Six Scenarios of the Trans-Millennium

Adapt and Survive – 10-year multifactor scenario of the future US/global business operating environment produced by a "Panel Survey" of 180 expert forecasters; conducted by the Global Futures Forum consultancy; published by GFF, December 2003.

The Future of Work, by Thomas W. Malone – an open-ended multi-factor extrapolation of long-term trends in the organization of work, and the features of employment and job design in the U.S.; published by Harvard Business School Press, 2004.

The 21st Century at Work: Forces Shaping the Future Workforce and Workplace in the United States – a multi-factor scenario produced by the RAND Corporation for the U.S. Department of Labor, describing how the most probable demographic, economic and technologic realities are expected to alter where, how and by whom work will be done in America over the next 15 years; published by the RAND Corporation, 2004.

Working in America: A Blueprint for the New Labor Market, by Paul Osterman, *et al.* – a projection of new institutions that are emerging to compensate for the decline/loss of industrial era social technologies, including labor unions, health insurance and pensions; published by MIT Press, 2001.

The Substance of Style: How the rise of aesthetic value is remaking commerce, culture and consciousness, by Virginia Postrel – an assessment of how IT is reducing the costs and increasing the variety of fabrication and design capabilities and of individually customized products and services – giving rise to rapidly growing employment in aesthetic services, ranging from plastic surgery and cosmetology to architectural and interior design, landscaping, graphics, gaming and film-making, while promoting diversity in food, music and clothing, commercial and residential décor and structural style, and employing millions of people who are being made redundant by automation and globalization; published by Harper Collins, 2004.

The New Division of Labor: How Computers Are Creating the Next Job Market, by Frank Levy, Professor of Urban Economics at MIT, and Richard Murnane, Thompson Professor of Education and Society at Harvard – an open-ended future scenario based on an analysis of trends in job content; identifying classes of employment that are likely to be [1] made redundant by automation/information, [2] lost to foreign competition, [3] off-shored, and [4] retained by the U.S. domestic economy; published by Princeton University Press, January 2004.

Bureau of Labor Statistics 10-year employment projections for 380+ industries and over 800 occupations can be found at: www.bls.gov/EMP