

Surviving the Great Global Brain Drain

The U.S. middle class is being downsized in a jobless recovery.
How come? "It's not the economy, stupid, it's the chip."

By Richard W. Samson

We're going out of our minds: Our mental processes are being systematically transferred into computers, microchips, networks, and mechanical devices of all types.

Think of it as a great global brain drain, the most critically pivotal – either empowering or suicidal – trend of our times. Yet it is under-reported by the media and virtually invisible to the public eye. It's not yet on policy makers' radar screens.

It could create a golden age for everyone but threatens – if current social and business practices continue – to force millions of blue- and white-collar workers below the poverty line while making the rich richer.

The current lagging job recovery supports the contention that American workers are being permanently squeezed. Though the recent recession was declared over as of November 2001, the unemployment rate has gone in the wrong direction, from 5.6% to 6.1% as of August 2003.

Industrial Age Precedent

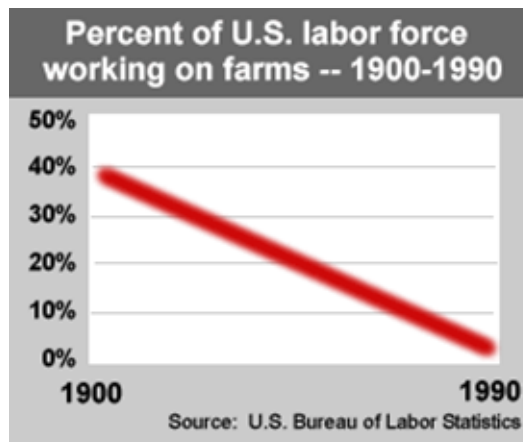
We should be experiencing historical *deja vu*, because we're starting to feel the same empowerment but suffer the same trauma experienced by laborers, farmers, and craftsmen when machine power extended muscle power but extracted the livelihood

from labor. Except now it's mind power that's flowing out of us and into our tools.

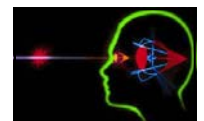
Back then, people adjusted by moving from labor-intensive jobs to know-how jobs. That won't work this time, because know-how tasks are the very kind being usurped. We need a new strategy for the new transition, and we should not expect an improving economy to restore the quantity and mix of yesterday's employment.

Farming Foretells the Future

As recently as 1900, it took almost 40% of the work force to grow America's food. Today, thanks to progressive mechanization, it takes less than 2%.



As farms became well-oiled machines, farm hands went to factories and offices requiring new know-how skills. (Those who



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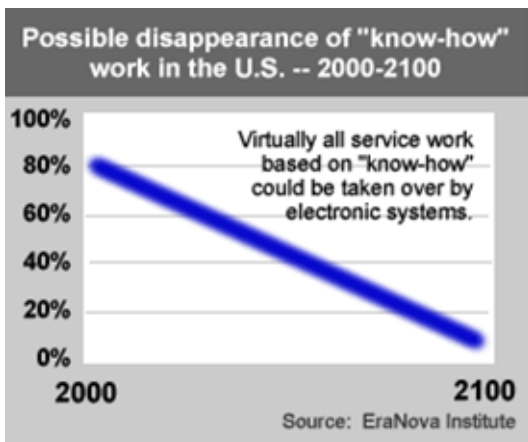
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stayed in agriculture had to master new skills in mechanics, bio-science and economics.)

Blue-collar work has retraced much of farming's downward trajectory. According to the U. S. Bureau of Labor Statistics, goods-producing workers decreased from 38% of the non-farm workforce in 1940 to 17% in 2003. Service-producing workers now account for more than 83% of the non-farm work force. It's not hard to imagine goods production soon joining farming in the less-than-2% club. At that time, the service sector would, by today's definition, boast more than 98% of the non-farm work force. But there's a problem.



As information technology automates white- and blue-collar functions alike, most jobs *as we know them* are being transferred into all-electronic systems. By 2100 it is possible that fewer than 2% of the U.S. non-farm work force will be needed to handle today's know-how functions in facto-



ries, offices, stores, professional suites, hospitals, research labs, and universities. To earn their keep, Americans – like yesterday's farm hands – will need to move on by moving up. But to what?

If know-how work is being taken over by ever-more-sophisticated tools, what's left for people to do?

Outflow of Know-how Work

White-collar know-how work is fast going the way of manufacturing and farming. Transferred bit by bit into electronic systems, these jobs are getting smaller and most will eventually go away entirely. Ideally, they will be replaced by a new class of jobs that has yet to be named: work involving hard-to-automate hyper-human skills that go beyond know-how. But that remains to be seen.

Due to the transfer of human functions into logic-savvy electronic or electromechanical systems, many jobs are on the way out or have already bitten the dust. Obvious examples include:

- **Typesetter** (extinct thanks to word processing and page layout software).
- **Receptionist** (replaced by electronic switches, "press 1 for sales").
- **Directory-assistance operator** (fast being replaced by automated alternatives such as AT&T's new voice-response service; dial 1-800-555-1212 to get your info sans human contact).
- **Personal secretary** (a dying breed, except for those serving the "big boss," thanks to word processing, email, electronic filing, and online calendars).
- **Various clerks, number crunchers, proofreaders, etc.** (widely replaced by spreadsheets, decision support systems, spellchecking).

Such occupations could soon be as rare as scrivener or lamp lighter. According to the Labor Department's Bureau of Labor Statistics, many service-sector jobs have lost people during the 1993 – 2003 decade,

when they should have gained 19% just to stay even with the overall increase in the work force. Examples include:

- **9,700 fewer travel agents** – down 7% (made more efficient but less needed thanks to online booking).
- **5,200 fewer people working in gas stations** -- down 4% (fewer attendants needed thanks to self-service pumps with credit-card readers).
- **7,600 fewer personnel in commercial banking** – down 1% (made more productive but less in demand by electronic systems, Internet banking options, ATM's, and bank consolidation).
- **300 fewer people in book publishing** – down a fraction of a percent when it should have added thousands to stay “even” (focusing more narrowly on selection and distribution as editing and publishing functions are relinquished to PC-wielding authors and agents, and to on-demand publishing services).
- **7,600 fewer musical groups and artists** – down 22% (less needed thanks to recordings and computerized backup music for a single live performer).

Media and publishing sectors seem to be playing musical chairs. On the losing-chair side, the Bureau of Labor Statistics reports that 47,600 fewer people work in newspaper publishing -- down 11% (thanks to automation, consolidation, and a public that prefers to listen and watch).

On the gaining-chair side, the decade netted 45,200 new jobs in radio and TV broadcasting. The increase, however, lags behind the nation's population growth — only 16% versus the 19% labor-force growth. (Don't count on much TV and radio job creation in the decade ahead. “Broadcasting automation” software is hot; and more and more equipment is being installed to simplify content creation, integration, ad insertion, and studio management. Then there's the job-squeezing trend toward media consolidation.)

The decade brought 133,000 more lawyers and employees in legal offices. But the in-

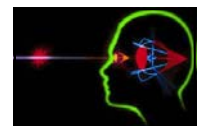
crease was only 15%, a relative loss compared to the 19% labor-force increase. (In spite of lawyers, lawyers everywhere, a real live one is not always necessary now that it's so easy to download fill-in forms for a will or contract).

Some popular job categories, not individually tracked by the government, are also under assault by the electronic brain drain:

- **Sales representative** (needed for complex sales but optional for orders that can be placed via automated systems on the phone or Internet).
- **Middle manager** (still needed but in fewer layers, thanks to information systems that link end-point production or customer data directly into reports available to higher management).
- **Information technology professional** (still needed in the U.S. but often replaceable by cheaper overseas pros thanks to Internet-based systems).

Some job categories have outpaced overall labor-force growth during the decade. However, professionals in these fields should not feel immune from brain-drain forces. Example include:

- **255,700 more workers in accounting and bookkeeping services** – up 39%. (The increase would be even greater were it not for fast-improving do-it-yourself accounting and tax-preparation software. The complexity of accounting, requiring human intervention, stems in large part from the changing constraints of nitpicking laws. Once artificial intelligence systems negotiate the intersection of law with accounting and bookkeeping procedures, the need for human number-crunchers will wane).
- **589,600 more physicians and medical office personnel** – up 42%. However, the number began to decline after 2001, down 19,200 or 6% between then and 2003. (Optimum health may always require human caring and consciousness. However, doctors are becoming optional for prevention and mi-



nor maladies thanks to information and self-diagnosis tools readily available on the net and in drug stores. Doctor downsizing could accelerate with advances such as medical artificial intelligence and robotic or semi-robotic diagnostic and surgical procedures.)

- **409,700 more people working in colleges and universities** – up 46%. (Hopefully real, live people will always be needed for motivation and creative interaction. But look for human educators and their administrative staffs to give way to information-delivery systems for repetitive course material or learning that requires access to large databases of hard-to-remember facts).

Today cost-cutting dominates executive decision making, and the most cut-able costs are people.

White Collars in the Crosshairs

In today's major corporations, white-collar jobs are being targeted with a vengeance. The reason, of course, is to increase productivity and the bottom line in order to remain competitive and to provide ever-increasing value to customers and stockholders, not to mention senior management. The targeting, made possible by electronic technology, is materializing in three key forms:

► **Corporate downsizing.** “Justified” by economic pressures, competition, or the need to play the merger game, downsizing is made possible by office automation, global networks, computers and electronic gadgets of all types. Fewer and fewer people can do the work of many. The current global torrent of acquisitions, spin-offs, realignments and restructurings is likely to continue for as long as information technology keeps on advancing.

► **Off-shoring.** Thanks to modern communications, additional white-collar tasks are being outsourced to bargain-rate foreign suppliers. According to Forrester Research, an estimated 3.3 million U.S. high-tech and service jobs will go overseas be-

tween 2000 and 2015, most to India but many also to China, the Philippines, Malaysia, the Czech Republic, and Vietnam.

Corporate savings are sizeable. According to Perras Group, in 2002 —

- **A software programmer** in India cost \$10,000 per year; in the U.S., \$66,100.
- **A mechanical engineer** in India, \$5,900; in the U.S., \$55,600.
- **An accountant** in India, \$5,000; in the U.S., \$41,000.

Anything that can be done by telephone or PC is a candidate for off-shoring, including sales, customer-care, web design, legal research, and editing. Those who supervise others are not exempt. According to the Forrester study, 288,281 U.S. management jobs will go to foreign pros by 2015.

An increasing number of America's largest corporations have moved white-collar jobs offshore: American Express, AT&T, Microsoft, Delta Air Lines, Oracle, Novartis, Hewlett-Packard, Dell, AOL Time Warner, HSBC, Texas Instruments, JP Morgan Chase, and many others.

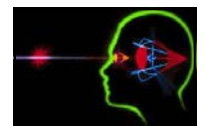
According to Frontline World, over half of the Fortune 500 have already participated in off-shoring. Others are expected to follow suit, and current participants are going for a second dip. For example, Oracle has announced plans to double its workforce in India, to 6,000.

Corporations often “launder” off-shoring by subcontracting to service firms such as eFunds of Scottsdale, Arizona, which in turn hire low-wage foreign pros. For example, Charles Schwab recently moved part of its information technology operation to a contractor in Bangalore, India.

In time the jobs lost to foreign workers will be lost by those workers as well, to all-electronic solutions. The job-sucking brain drain is a two-stage process that mirrors what has been happening with manufacturing. First, millions of jobs are given to low-paid foreign workers, then the functions are



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transferred to even-cheaper people-free systems such as automated factories. Off-shore, then off-people.

NOTE: While "off-shoring" is a recent term applied to white-collar outsourcing, the practice does not differ from exporting manual work. In fact, the outflow of blue-collar jobs has been continuing apace; in the two-year period after July 2000, 2.6 million manufacturing jobs were lost.

► **Inter-company systemization.** Within the next decade, many corporate jobs will be impacted by the deployment of "Web Services." This new software technology automates interactions between companies, on the heels of software that has already automated functions within individual companies. Workers in jeopardy include --

- Purchasing agents
- Internal sales people
- Customer service representatives
- Stock clerks
- Accounting personnel
- Paper pushers of all types

The key benefit touted for Web Services is automated interactions that yield savings in time and cost. Translation: bigger bottom lines through smaller payrolls.

The rollout of Web Services appears to be substantial. A survey of 796 medium to large companies, conducted April, 2002, by The FactPoint Group and Outsource Research Consulting, indicated that nearly half are piloting or deploying Web Services. First to go will be the lowest-level, most routine white-collar jobs; then office-support and middle-management positions will be on the block. Upper management, already stressed by recent reorganizations, will be further pressed as well.

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The job dislocation examples cited here are relatively minor compared to the employment impact that may be on the horizon. It is possible that we are less than 5% "in" to the information age in terms of the

mental functions that may be usurped by electronic intelligence.

- Within the next two decades, grid computing is expected to turn the Internet into a giant supercomputer utility.
- Artificial intelligence -- already practical in fields such as oil exploration -- will begin rivaling college professors, career counselors, biotech researchers, investment advisors, and economists in the expertise they can deliver.
- Promoted by IBM and DARPA, "self-aware computing" (dubbed "autonomic computing" by IBM, after the autonomic nervous system) is coming on strong. The idea is for complex electronic systems to monitor their own performance, self-correct and self-maintain — without human intervention.
- When nanotechnology becomes practical as a production and data tool, automation will accelerate at warp speed.

Look for know-how service jobs to join the less-than-2% club as soon as mid-century.

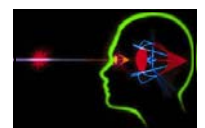
IT Job Losses Lead the Way

While information technology (IT) is a key cause of the jobless recovery, it has become, ironically, its most prominent new victim. Even Chief Information Officer (CIO) jobs are in jeopardy.

As IT powers the brain-drain shift, IT employment itself leads the way to white-collar oblivion. A Gartner Inc. study predicts that 5% of all American IT jobs will be moved offshore by the end of 2004. The rate is twice that for software-development and IT service-provider jobs: 10%.

Four currents are sweeping IT jobs, up to CIO, overseas or away entirely:

- Continuing mergers and restructuring that are combining multiple programmer, analyst or CIO positions into one.
- Improvements by enterprise software and platform providers that simplify installation, operation and maintenance. Translation: smaller IT staffs required.
- Jobbing out of IT functions to service



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providers such as IBM. This not only reduces in-company IT staffs but overall IT employment, since service providers introduce economies of scale to remain competitive. One of these economies is off-shoring of the IT work, expected to siphon off 10% of U.S. IT service firm jobs by the end of 2004 according to the Gartner Inc.

- Emerging technologies, such as grid computing and Web Services, that are turning computing into an external utility like electricity.

IT people seem to be shooting themselves in the foot as well as blasting employment in all fields facilitated by IT. It's not their fault, but that of myopia at the highest corporate, investment, and governmental levels. Still, the damage is being done.

The current job impact in IT should be viewed as a bellwether for other white-collar occupations. Any work that is location independent — doable by phone or PC — is endangered. If the work is largely culture-independent, like IT, it is especially vulnerable. It can be done by anyone anywhere on the globe who has English as a second or first language, and is willing to bone up on American ways.

Employment beyond IT — in IT-enabled fields — is following IT's job-loss lead. A survey by management consulting firm A. T. Kearney shows that financial-service firms such as banks, brokerages, and insurance companies will move more than 500,000 jobs overseas within five years.

Large business research and consulting firms including Forrester are promoting off-shoring for its money-saving potential. For example, a white paper from Deloitte Consulting points to successes of off-shoring pioneer such as Citigroup and GE Capital, and advises clients that "lately off-shoring has begun to undergo an important metamorphosis, transitioning from 'something to consider' to 'something that must be done.'" IBM, long resisting off-shoring, has now admitted to seriously considering it.

Job Creation not Automatic

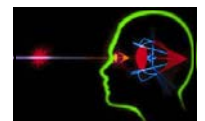
"When technology eliminates jobs, it creates new, better ones." This old saw has been largely true until now. Technology did replace blue-collar jobs with new white-collar positions. But the future does not always mimic the past.

New employment is being created, but it's not always a step up from the disappearing kind. For example, during the last ten years, 1.7 million new jobs were created in the nation's eating and dining places, an increase of 26%. That's great if, when you lose your publishing or information technology job, you want to wait tables in TGI Friday's or cook fries in McDonald's. (Bear in mind, too, that if e-tech can create automated grocery checking, it can create automated burger serving and other new self-service options. Already, fast-food restaurants have streamlined food preparation and conditioned customers to fetch their own tableware, napkins and drinks.)

Small businesses have traditionally produced two-thirds to three-quarters of all the new jobs in America. Their ability to do so now is undermined by the flow of white-collar as well as manufacturing work abroad. Many small new white-collar businesses depend on sub-contracting that trickles down from the corporate giants. Much of that sub-contracted work is expected to flow to small suppliers near prime contractors abroad. In manufacturing, small U.S. suppliers of parts, materials, and maintenance are losing out too. The small-business job engine could stall.

This could spell a long-term squeezing of the middle class. In addition to unemployment going in the wrong direction — from 4.1% in August 2000 to 5.6% when the recession officially ended in November 2001, and then to 6.1% in August 2003 — the total number of working people continues to decline in spite of increasing population.

In August 2000 there were 132 million working in the non-farm private sector; in August 2003, the number had dwindled to less than 130 million.



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Some economists believe there is a shift from working for others to working for oneself. However, entrepreneurship may not be our white knight. Many laid-off high-tech employees now bill themselves as “consultants” rather than admitting to being unemployed, seeking freelance projects while hoping for the job market to improve.

Will the demand for employees pick up any time now? In the 10 most recent recessions, only the most recent two have failed to register job growth 28 months after the recession began. Employment was up 7.3% 28 months after the 1945-47 recession and up progressively 5.4%, 1.6%, 1.0%, 1.1%, 1.8%, 0.3%, and 0.6% for the next eight recessions, through 1983, according to the Bureau of Labor Statistics. Employment was *down* 0.9% 28 months after the 1990-92 recession, and *down* 2.9% after the most recent one.

It's a picture of declining post-recession job-creation that corresponds well with increasing productivity and replacement of human skills by technology. In the past, productivity gains -- like the recent 5.7% -- created new jobs for laid-off workers. It doesn't seem to be happening now. Thanks to IT, service employment is starting to bleed along with manufacturing.

The reason that the old saw, “technology always creates new, better employment,” doesn't ring true today is that electronic technology is an entirely different animal. Work itself needs to be re-defined, and new forms of work need to be invented. This must happen intentionally, or the future will unfold chaotically, even tragically.

The current trend — the downsizing and impoverishment of the U. S. workforce — does not bode well for America's middle class, or for anyone except the minority who are profiting from it.

Positives and Negatives

A worldwide mental muscling-in is well underway and fast gaining momentum. Like machinery in the transition to the industrial

age, electronic systems are potentially empowering us but currently displacing us. The benefits can be great but two drawbacks loom. They're the same drawbacks that prevailed as our muscles got augmented and replaced in the transition from the agricultural to the industrial age: (1) the trauma of transition, and (2) the prospect of unintended bad consequences at the mature end of the transition.

The present trauma of transition is likely to vex all of us and will severely oppress many. What are we supposed to do? What's the right career path for today's travel agent or VP of marketing? The infiltration of electronic methodology is widespread and relentless. Safe havens are becoming harder and harder to identify; white-collar, professional, and management people are being challenged even if their job type hasn't changed much, thanks to technology-driven restructuring that has morphed stable companies into volatile, short-term employers.

Unless we consciously intervene, the trauma of change, already acute for many, will get worse as the transition to global electronic intelligence accelerates.

Greater Wealth and More Poverty?

The U.S. is commonly viewed as the world's richest nation, but our wealth is poorly distributed. The official U.S. poverty rate, reported by the Census Bureau, is 11.7%. That's 32.9 million poor and destitute Americans.

It's a dismal statistic compared to other free nations. According to the Organization for Economic Co-operation and Development (OECD), a greater percentage of Americans live below the poverty line than in 12 other leading nations including Canada, Germany, Japan, and Sweden. Our rate is about double France's and triple Finland's. Our poverty rate for children under 18 is 16.3%, double the rate of Western Europe; that's one in six of our future citizens without means for adequate food, health care, housing, or higher education.



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We've grown into a high-tech banana republic with lots of wealth accumulated at the top, and lots of destitution at the bottom. According to the Luxembourg Income Study (LIC), among 29 major nations, only Mexico and Russia have greater income disparity than America's.

Our middle class is hanging on, but just barely. According to Bureau of Labor Statistics data, during the "golden years" of American industry — 1947 to 1973 — real hourly wages grew by 75%. Since then they have stagnated. Consumer debt has reached record levels, and new bankruptcy filings by individuals totaled 1,573,720 for the 12-month period ending March 31, 2002, a new record, according to Administrative Office of the U.S. Courts.

Most Americans are working harder to maintain a stagnant lifestyle. According to the Economic Policy Institute, a two-parent family worked 16 more weeks per year in 2002 than in 1979. That's four extra months (two per parent), with additional expenses for childcare, commuting, insurance, work clothes, and business lunches.

Only the wealthy seem to be getting wealthier. The Congressional Budget Office (CBO) reports mounting income disparity between 1979 and 2000. The poorest fifth of the population increased their after-tax income by less than 9%. The middle fifth, 15%. The top fifth, 68%. The top 1%, however, made 201% more. The disparity of wealth — total assets — is even greater. According to Federal Reserve data, by 1997 the top 1% of households had accumulated more savings, stocks, bonds, real estate and other assets than the bottom 95% combined.

Wealth accumulation is especially rampant among the CEO's of America's leading corporations, where employees are being shed and remaining workers squeezed through restructuring, factory closings, and off-shoring. In Fortune's latest survey of the top 100 corporations, median CEO pay rose 14% from the previous year, in spite

of huge losses for their stockholders, to \$13.2 million. Using OECD data, the Bureau of Labor Statistics reports that American CEO's make about twice as much as their counterparts in Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, and the United Kingdom. The CEO of MBNA netted \$194.9 million in 2002. His firm charges consumers — some unemployed due to corporate cost-cutting — up to 27.98% interest when they miss payment deadlines on ballooning credit-card debt.

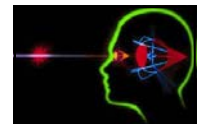
Surely there is no conspiracy. Nobody is intentionally transferring wealth from the nation's poor and middle class to the already rich. But significant transfer has already taken place and shows no signs of abating. Motivated, most likely, by healthy self-interest run amuck, it is enabled by fast-improving technology that allows more and more jobs to be performed anywhere on the planet, with or without the need for human involvement.

As American jobs flow overseas and into automatic systems, the middle class could shrink and the unthinkable could happen: many white- as well as blue-collar families joining the ranks of the long-term unemployed and working poor.

Pitfalls of Bad Planning

Myopically pursued, the end-state — the mature information age — could range from awful to barely tolerable, but even if it's miraculously wonderful, getting there could be rocky. Unmanaged transitions of this magnitude tend to dislocate the many while favoring the few. People get chewed up in changing gears. Who wants to be one of the grunts taking the brunt?

We have more to concern ourselves with, though, than the trauma of change. The future we end up with, after years of transitional pain, might not be the cornucopia we hoped for. The mature information age could be mostly wonderful, but contain some rotten fruit. Depending on our actions



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now, we could find ourselves blossoming in a golden age, or shriveling in a technosphere bent on making us irrelevant.

If we fail to play our cards right, we could lose our mental dominance to electronic competence. Hello to our worst science-fiction nightmares. Goodbye to our lucrative livelihoods, lush lifestyles, and eventually – perhaps -- our very existence. But the electronic brain drain, properly managed, can take us to brighter destinations.

The Right Strategy for Now

The key is to employ an appropriate strategy for negotiating the transition, one that is actionable on personal as well as social levels. The strategy that got us from the agricultural to the mature industrial age – moving from muscle work to know-how work -- is poorly suited to the present shift.

As know-how gets easier and easier to store and apply through networks and automatic systems, the winning strategy is to move up from know-how work to the next rung on the mental ladder: “hyper-human” or “meta-mental” work. Think of it as “aliveness work” consisting of functions computers cannot easily replicate.

Get paid for being alive? May sound crazy, but consider this argument: Computers and electronically powered systems are inherently better than us at –

1. Number crunching and routine logic
2. Mass storage and retrieval
3. Remote sensing & control
4. Structured or routine decision making
5. Control of repetitive processes
6. Simple or labor-intensive instruction
7. Manual operations requiring power and logic-controlled repetition

We can't expect to win against electronics at any of these things, though we can struggle at it for years. So how can we prevail? Where are we inherently superior?

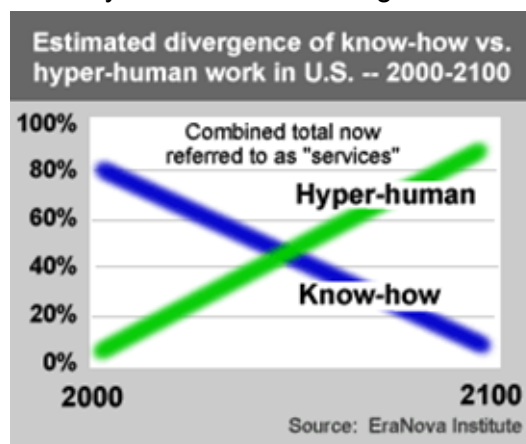
We're alive and electronic systems aren't. That's a big, vital difference – one that may

be overlooked by decision makers under competitive pressures. Consider what aliveness involves:

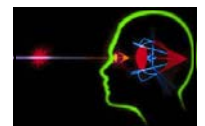
1. Conscious perception & motor control
2. Wanting, valuing, and intending
3. Pursuing ethical objectives
4. Love, friendliness & other positive feelings and behaviors
5. Creativity & imagination
6. Subjective decision making
7. Hypothesizing
8. Social skills

Aliveness, in its best mode, also includes a vital overall ingredient: reflection or meta-consciousness. In our brightest moments, we're not just conscious, but conscious of our consciousness. Reflection or self-awareness defines the properly-functioning, responsible human.

In moving up from today's know-how work to hyper-human work, we need to start tracking the workforce using different words. We need to divide today's “service-sector” into two strands: know-how service work, being taken over by technology, and hyper-human service work done by people. We also need to track hyper-human forms of manual work that are performed with creativity, pleasure, and life. Examples include urban agriculture, specialized engineering, local production, artistic creation, and many varieties of nurturing.



In addition we need to acknowledge our informal economy, in which we share things and services with family, friends,



and colleagues without resorting to cash. This “free” economy could expand greatly as hyper-human activity gains sway.

Some believe the U.S. is transitioning from an industrial society to something higher in the occupational pecking order: an “idea economy.” Federal Reserve Board chairman Alan Greenspan has spoken of an America where value is no longer derived by creating and moving things, but by creating and moving ideas.

Surely this is a sound direction if “ideation” is appropriately defined. Ideation needs to be cultivated as more than ivory-tower thinking or board-room string-pulling. Ideas spring up close to where things happen — in agriculture, manufacturing, and get-your-hands-dirty service work as well as in basic research, big-iron engineering, biotech development, or global marketing.

Former Secretary of State Henry Kissinger has warned that outsourcing could suck the innovative life out of America’s industrial base. Ideas for improvement come from the factory workers, engineers, and managers where the work is done. As more and more white-collar work, especially high-tech forms, is off-shored, guess where the new ideas and intellectual property are likely to come from. Intel founder and CEO Andrew Grove has cautioned that tomorrow’s most advanced engineering could come from India or China.

Idea generation needs to remain strong in the U.S. In fact, it should grow stronger along with an accentuation of other hyper-human skills. Hyper-human skills flourish in active pursuits — including food production, making things, and helping others — where we engage our bodies, physical elements of the environment, feelings, and human interactions, not just airy thinking.

We need to re-think “local versus global.” That distinction is more germane than manufactured versus thought-up, or down-and-dirty versus board-room clean. Which goods are best produced a mile away rather than a continent away? Which foods

are best grown within walking distance rather than flying distance? Mindless globalization creates enormous wealth for a few, but destroys communities, distorts economies, taxes the environment, and of course disrupts employment.

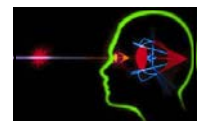
In order to move to a hyper-human future, we need to mobilize hyper-human skills right now: clear, sensible thinking as well as caring, responsible goal setting, planning, and determination.

Transition Tactics

As a practical matter, how can we get from here to there without getting killed? Sensible steps may be taken in four realms.

► **Corporate tactics.** Future-savvy executives will profit from this advice:

- **Off-shore only if survival depends on it**, and be prepared for employee backlash including union organizing.
- **Reevaluate the wisdom of disrupting a stable workforce.** Companies generally can downsize, off-shore, and cut human costs only so far. At some point a weakened middle-class will lose buying power. Henry Ford introduced the revolutionary idea of paying his employees enough to afford to buy the cars they built, a neglected concept today. A consumer engine without steam plus alienated employees could spell the death of many companies. Outright dishonesty is not the only way to become an Enron or Worldcom.
- **Lobby Washington for a level playing field**, reducing the need to cut costs through off-shoring, export of manual work, or restructuring.
- **Add hyper-human tasks to existing jobs**, with relevant training, to spark innovation, intrapreneurship, teamwork, and focus on customer needs.
- **Automate know-how to support hyper-human functions, not replace people.** Remember, there’s no longer any new place for people to go, other than to hyper-human work.



- **Put increased emphasis on “mental models”** that promote practical reflection for increased effectiveness in product development, sales and marketing, management, and other areas.

CEO's of large firms had better lead the revolution by creating new and better jobs. Otherwise they will be the victims of union resurgence, professional associations turned militant, legislative constraints, and activism of all sorts. Vandalism by angry employees is already a concern of corporate security departments. So is cyber-vandalism. And as some displaced professionals adopt Ted Kaczynski-like attitudes, home-grown terrorism could flourish.

Running a large company is not just about making money or making stockholders happy, and not even just about making customers happy. It's about serving society, building community, and improving the general lot of everyone. Surely that includes serving the needs of employees and building sound corporate cultures.

The future may belong to companies like GE, 3M, and IBM that – recent aberrations aside – have traditionally placed a high value on customer service, innovation, teamwork, community citizenship, and constant improvement with minimum human casualty. Look for a new emphasis on human-centered business practices, training and development, and electronic systems that empower – rather than harass – employees and customers alike. Call it “corporate aliveness.”

Look for more and more jobs recast to include the “aliveness” qualities exhibited by entrepreneurs, inventors, authors, composers, teachers, and others who like to be creative, do good, and empower others.

Sound corporate principles can be maintained even in conjunction with practices such as off-shoring. In early 2003, JP Morgan Chase announced that it would move part of its research work — preparation of stock market reports — to India. No U.S.

workers would be laid off, they said, but freed up to focus on customers and high-level financial analysis.

► **Tactics for government (federal, state, and local) and concerned citizens.**

Reshape the fabric of society to support positive transition.

- **Introduce legislation and pursue trade negotiations to slow the pace of off-shoring.** To resist off-shoring, U.S. companies need a level playing field. In time, perhaps, there should be no barriers to foreign know-how suppliers. While the demand for employees remains soft, however, American pros need a break.
- **Review tax policies.** Recognize that off-shore workers pay no U.S. taxes. The U.S. infrastructure that supports U.S. companies needs to be paid for by somebody. Consider European tax policies that prevent an excessive wealth gap while generating much-needed revenues for social services and infrastructure.
- **Prevent civil unrest.** Remember that a wealth gap provoked the French Revolution and that Thomas Jefferson said, “The tree of liberty must be refreshed from time to time with the blood of patriots and tyrants.” Revolution, terrorism and non-violent forms of social protest all have their roots in perceived inequality.
- **Beef up the hyper-human content of educational programs.** In grammar through grad school, put more emphasis on creativity, discovery, ethics, entrepreneurship, and flexible problem solving.
- **Rebuild the local.** Balance globalization by putting a new emphasis on cohesive communities, in the U.S. and abroad. Promote “intercommunities” – physical analogs of Internet nodes in which living, earning, learning and culture coexist and reinforce one another in close proximity.
- **Re-evaluate everything** from the nature of money to the responsibilities of citizenship, health to equality of opportunity.
- **Use investment and philanthropy** to revive small business that hires American. The Bush tax cut, going mainly to the rich, is supposed to create jobs. It

could. If the top 10% invested their wind-fall and a fraction of their wealth in a small-business superfund, it could dwarf the billions for rebuilding Iraq.

► **Collective-action tactics.** Join together to make a difference.

- **Organize.** Through professional associations or unions, press corporate employers for jobs and decent pay. Make your voice heard in Washington. If CEO's can earn tens of millions, others can at least eke out a living.
- **Use buying power to preserve earning power.** Join consumer groups to put pressure on suppliers of goods and services. Boycott those that shed employees with abandon or introduce neo-sweatshop practices. Help move consumption to buying local and buying value versus buying far-away and cheap.

► **Individual tactics.** Advice for affected workers includes –

- **Gradually move to work high on the hyper-human scale.** In the near term, there will be money in know-how jobs for many; longer-term, smart, zippy systems will prevail. If a form of work takes creativity, goal-focus, ethical behavior, responsibility, and social skills, it's likely to have a future and generate income eventually if not right away. Entrepreneurship will be in demand for a long time, as will

intrapreneurship within companies. So will scientific research requiring "aha's," health care, education, and social services of all types. If an endeavor requires vision and caring, if there's a need for it and you love it, it just might be the thing that makes you money at some point.

- **Constantly hone your hyper-human skills.** Be a generalist and get better and better at all the things that make people special, from caring to innovation to persuasion. That will help your bottom line in any kind of work at any time.
- **Cut back.** Don't count on corporate or social policy to protect your livelihood. In the absence of reform, you may need to compete with an Indian pro willing to work for a few thousand dollars per year. Assume that U.S. employers will increasingly use the pressure of foreign pay scales to negotiate lower pay domestically. Find ways to live better on less.

The winning strategy for the information age is to inject "aliveness" — including deliberate reflection — into everything we do, and let electronic systems take over the dead, dull stuff.

Go with the brain-drain flow and come out on top. With clear perception and the right method, we can surf the trend to the future we want. This is the only way to avoid chaotic, even catastrophic consequences.

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*This report is excerpted from **The Human Edge**, a forthcoming book by the author.*

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