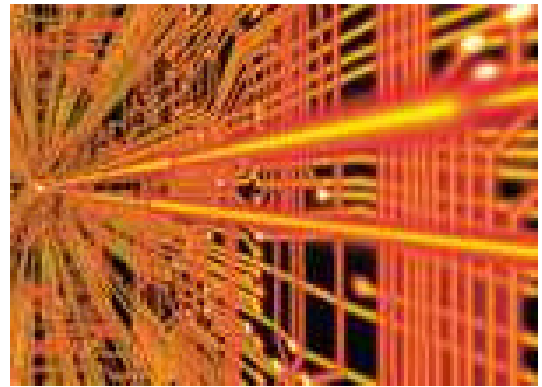


# The Coming Job Glut: Expanding Work in The High-Tech Sector

By Ivan Handler  
Chicago Third Wave Study Group



## Introduction

I am a highly skilled, highly paid high-tech consultant. While I have been a progressive since 1960s, I have also been a computerphreak since 1963. I have grown up with this technology and have experienced its social impact firsthand--in humanity's ongoing crises of internecine war, increasing joblessness, and deepening alienation and despair.

I have been engaged in the debates on these topics from the beginning. While I do not want to minimize these crises or the role of information technology in any way, I have often felt that these discussions were one-sided. I believe they frequently did not take into account the internal dynamics of the information technology sector itself and how these dynamics can inform progressive or revolutionary action.

This paper reflects my experiences from the inside of a large number of corporations, including many in the Fortune 500, which I have serviced over the last several decades. It responds to many of the "end of work" scenarios that have been circulating, along with some ideas on the implications of these perspectives for political action. For the sake of clarity, I focus on employment. But I am quite aware of the many other areas that have been adversely affected by information technology including war, civil liberties, criminal justice, education and economic speculation.

## What the Traditional Left is Saying

The conventional wisdom on the left on technology and jobs goes something like this:

Disastrous unemployment and underemployment is being created by two factors, both stemming from the information technology explosion that started in the 1950s:

1. Automation is increasing worker productivity at the expense of jobs. Fewer workers are needed to produce industrial goods in greater quantity and higher quality. This is causing increasing divisions and conflict between a new but small elite of skilled high-tech workers, a shrinking sector of low paid unskilled workers, and a growing pool of unemployed, underemployed and permanently unemployable workers.
2. Globalization is allowing transnational corporations to pit the working class of one country against another. The transnationals are driving down overall labor costs in a terrible race to the bottom. The future will be one where all of the world's wealth is concentrated in a few hands while with the overwhelming majority of humans are locked out of the global economy or locked up in prisons as slave laborers. In the new global and totalitarian order, governments themselves are competing with each other to see who can best subordinate themselves to the interests of transnational corporations.

What is to be done to prevent this dismal outlook from becoming a reality?

“Saving Jobs at Home” (usually meaning in highly developed 1st world countries) is the first key battle. Some add that demanding adherence to human rights and ecological standards by employers is also critical. Some go even further to argue that saving jobs or the environment will not work by themselves. Instead the capitalist system must be destroyed to be replaced by a favorite flavor of socialism, and that in many cases even the demand to save jobs is “misleading” workers into accepting another round of phony reforms that will not benefit the working class.

### **Why the Traditional Left View is Incomplete**

I do not want to argue that the above views are substantially wrong, even in the short run. Given the incredible increase of misery of all kinds in the last several decades, it is hard to argue, without severe qualifications, that the information technology revolution has benefited the majority of people on this planet. Instead, the problem with the typical left perspective is that it views technology from the outside looking in; it does not take into account the internal dynamics of the information revolution and both the promise and peril waiting there.

The first inkling that there is something missing in about the left perspective is the increasing shortage of high-tech workers. The New York Times, February 27 headlined an article “Atlanta Loses Jobs but Still Needs High-Tech Workers.” Around 5000 jobs were about to be lost from Lockheed Martin, BellSouth and Coca-Cola. The article goes on to say "If Atlanta's economy has run into a rough patch, it is not because there is a shortage of jobs. To the contrary, they say, there is a lack of people to fill them, particularly in technology(1).”

In fact, programmers, analysts, web designers, content specialists and project managers are in such demand that there is no hope of fulfilling all job openings any time soon. Congress is even moving to allow the importation of more skilled workers from Asia, Russia and Eastern Europe to work in the US. This is not just because they will work for lower wages (at least until they are granted permanent residency). It is because there are not enough native-born US citizens who are qualified or who are trying to become qualified to fill these positions.

A widely quoted Feb. 9, 2000 AP article by Bart Jansen states:

“The Bureau of Labor Statistics reported that the number of high-tech jobs nationwide grew from about 4 million in 1990 to more than 4.8 million in 1998, and projects jobs in some categories will double in the next six years.(2)”

Let’s look at some of the current contributing factors:

**The Low Road Option.** Poor people are being channeled into low-level service jobs or prison rather than college and high-tech jobs. There is no rational reason for this except for the tradition of racism and class bias that so infuses the US and most other “advanced” nations. Our political life is warped by a “cycle of idiocy”: First, politicians exploit fear of crime among minorities and the poor to get elected. Next they put more poor and minorities in jail to “fulfill their promises to the electorate.” The prison population grows wildly even as crime goes down, leading to harsher conditions and fewer educational or training programs in prison. Released ex-offenders have even less chances at decent employment, and end up going back to prison. This adds to the fear of minorities and the poor, making it even easier to get elected by fear tactics, and so on....

**Older Unemployed High-Tech Workers Are Being Ignored.** While this is certainly happening to many, it is not clear how many are really being left out compared to the number of positions available. The other thing to keep in mind is that the high-tech world is unforgiving. You need to constantly be learning new skills and re-inventing yourself. If you fall off the train, it can be very difficult and expensive to get back on. Very few employers want to train older workers when they hire them.

**The Bill Gates Model.** More and more young people want to be the next Bill. In many cases they don't finish college (just like Bill) or even high school before starting their own businesses. Business schools are even starting to feel the heat since they are the traditional stepping-stones to CEO-hood. Thus being a hard-grinding programmer or high-tech worker has lost its allure among many young Americans, even though someone has to come in and fill those empty spots or there will be no one to make the next Bill's bills.

**The Info-Gamblers.** Another aspect of the information revolution is the incredible growth of speculative markets. Anyone can now become their own broker. Those that do not want to become Bill, want to make their millions by joining the hot action on Wall Street and similar institutions world wide. In short, productive labor is out, gambling is in.

The above circumstances are not inevitable or inherent to our society. There are any number of scenarios that could come about to ameliorate or change them. Whether or not you believe political and business leaders are smart enough or humane enough to see how to do it, the solutions are not that complicated.

But I want to argue a different point. It is certainly good to promote social policies that give more people productive skills, especially if they have been locked out of the economy. But I believe the more successful we are in producing skilled high-tech workers, the greater the shortage of high-tech workers will become. Again, this does not mean we should not attempt to bring people into well paying high-tech jobs; but it does mean that we will have to radically readjust our thinking about the future of economics.

## **Information and Automation**

cy.Rev has long argued that the fundamental commodity of this new economy is not goods and services or even money, it is information. This new economic system is based on the ever-expanding production of information. Improvements in the quality and quantity of goods and services are, in most cases, a side effect or by product of information production. That is the true meaning of automation.

In an industrial economy, there are relatively long cycles involved in producing new products for the market or even for internal use. Production involved many steps, a large portion of them involving relations with suppliers who were outside the control of the corporation needing what they supplied. One of the reasons automation has come into existence is to shorten those cycles.

The production of information, on the other hand, can follow very short cycles. In an automated process every interaction in the production cycle is usually audited at some level. This mean that even in the early design stage of a new product, information is being produced in large volumes. In many cases the raw information produced contains too many details, so it is further processed into reports, which in turn are presented to the people who manage the process. Then the results of a large number of these reports may get aggregated into other reports and so on.

In order to continue to shorten production cycles and speed up time to market, corporations are racing to make a process more efficient by integrating more and more of the components of the production cycle into a single unified information structure. This means that the people who work in these cycles have more access to information than they have had in the past.

A manufacturing engineer, for example, may gain access through an Enterprise Resource Planner (ERP to the cognoscenti). The ERP contains a diagram of a large device (say a jet engine) where every component part is linked to a database that is constantly refreshed with all of the inventory information known for that component. The engineer may then have the system automatically poll an Internet site for the best deal to be had on that part. The part can be ordered on the spot, with a purchase order immediately sent to the chosen supplier. This process also includes regular updates on when the part is to be delivered, by which carrier, with the appropriate bill of lading identifiers automatically sent back to the initiating ERP system, which then can keep the engineer and management team apprised of the status of the part order. The system can even be set to notify the engineer with an email if the expected arrival date changes for any reason.

Things can get even more complicated. The engineer may need to do research on the suppliers to make sure the one chosen will supply parts that are high quality. This can mean sifting through journals and calling contacts at other firms. Nowadays it is more likely using a search engine on the Internet or on the local document management system (if the corporation has been saving articles on suppliers in its document management system). Then issues may arise about which kinds of parts can be assembled by the robots that were just installed on the assembly line. More searches and telephone calls proceed from here. If the engineer makes any mistakes, it could seriously impact production and lose millions of dollars.

So the engineer may start to rely on special software. Or he or she may look to Internet sites focused on jet engine production that can furnish answers quickly and reliably. While it costs money for the software or to use the Internet site, it also reduces the time it takes to make a decision and does not increase the number of people in the engineer's department. The point is that the management of information is becoming the primary factor determining how things are done or not done in this new economy. Better information management means more efficiency and (leaving aside market speculation) more profits.

Unfortunately, information management comes with its own set of special circumstances. It involves several components: collection, classification, storage and retrieval.

Collection is the process of gathering the data from its source and preparing it for entry into an electronic repository.

Classification is where other descriptive data is added to the source data to make it easier to find later on. Classification can happen before, during or after collection(3).

Storage means placing the data in electronic media for future retrieval. Storage involves worrying about how quickly the data needs to be retrieved, how much redundancy is needed to insure reliability and whether or not to store the data centrally or in a geographically dispersed system.

Retrieval is a collection of processes where a user can request information based on any number of identifiers from unique identifiers such as a product id to non-unique identifiers, such as keywords or concepts.

## Infoglut

The retrieval of information thus depends upon the classification of data. This is where things start becoming even more problematic. Information is usually classified based on the current classification models used when the data is entered. In many cases these classifications are not useful when the information is opened up to larger circles of requestors. What happens then? Either a large project must be undertaken to reclassify information so it is useful to the larger circle. Or workers must be retrained to do the reclassification. Or special expensive software may be designed or purchased that purports to do this automatically. Or, most likely, a combination of all three.

Now let's say the information is successfully reclassified, and the corporation is even more efficient. This means that even more information is being produced at an even faster rate. As competitors catch up, more pressure is put on the corporation to integrate more information into its systems and to make it available to even larger audiences. This causes another problem with reclassification, which leads to even faster information production, and so on.

Sheer volumes of data can also force the need to refine classification data. As more data is entered into a system, more and more data falls under the same classes. This may not be a problem for people who know unique combinations of elements that can be used to find what they need. But it is a problem for the majority who do not have that knowledge. In any event reclassification becomes necessary and users must be trained in the new system. Or the corporation must rely on automated classification software that can process millions of data elements, but cannot understand human language. In some circumstances, this means critical data can be lost unless someone can correctly deduce the right combination of factors to use in a query. Anyone who has used an internet search engine to look for obscure data has experienced this first hand.

With the internet becoming not only the common means of exchanging information, but the common repository for information, this cycle builds up even faster since any time anything is added to a repository, some portion of it will be opened up to the internet. There are two responses to this situation: 1) build new search/classification software to handle the increasing load and 2) build new information specialty businesses or business units that can provide information very quickly in a very narrow range of topics. The latter expansion is referred to as both horizontal and vertical growth. Horizontal growth refers to expansion into new areas and vertical growth implies deeper expansion into existing areas.

Of course these solutions must be short lived. Since no matter how efficient the search software is, when enough new information is added to a repository, searches that produced short lists of possible resources start to produce lists that get larger and larger until the searches become useless and must be refined. The same goes for information specialists. Sooner or later what started as a small niche will be seen as overly general and unmanageable so that newer smaller niches will need to be created. Since the whole dynamic of the information revolution is to produce more and more information with increasing acceleration, these solutions will become obsolete faster and faster.

While lots of salespeople who sell the latest search/classification software based on the latest computational linguistic techniques will claim that they will have this problem solved within a few short software generations. This does not seem very credible to me. The whole history of software is riddled with these overly optimistic claims that never come true. In part this is because it is easy to make large strides in software when you enter new territory. This breeds a simplistic optimism that all problems will turn out to be this simple, so that a linear extrapolation of the progress that has been

made yields fantastic claims for the near future. As in all technical fields, the first few remarkable bursts of activity usually yield to long years of slow and uncertain progress.

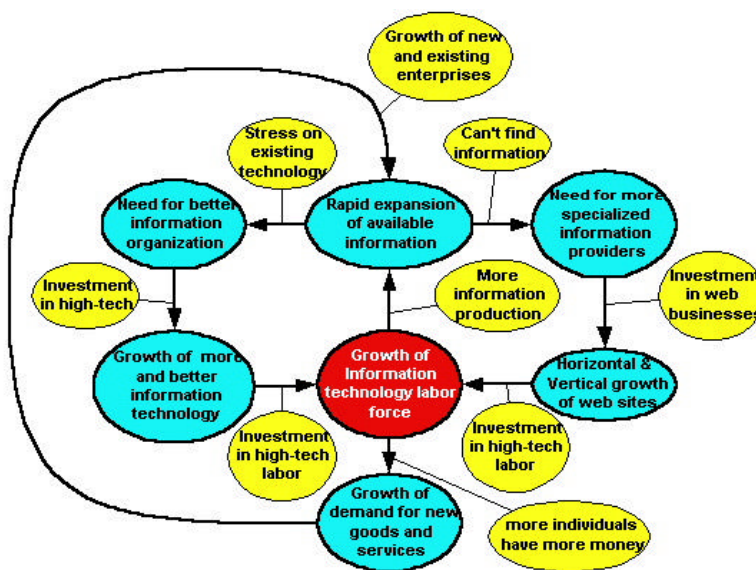
### Infoglut causes Jobglut

The effect this dynamic has on employment is what we want to look at now. In this case it should be obvious that as the information management problem grows exponentially, the need for high-tech workers grows right along with it.

- More software engineers and computer scientists are needed who know the latest technologies to create more powerful software.
- More software integrators are needed to implement the software at corporate sites.
- More information specialists are needed to specialize in particular information niches.
- More web designers are needed to build the web sites for all of this activity.
- More support staff are needed to provide technical support for the expanding infrastructure and so on.

The more high-tech workers that are found, the more information that is produced giving rise for the need for even more high-tech workers to help manage the resulting information explosion. As automation erodes the need for low skill labor, it is dramatically increasing the need for high-tech labor.

Finally, the larger the size of the high-tech labor force, the more money they have to spend on goods and services. In turn this stimulates the economy, which translates into more information expansion, which re-enforces the rapid expansion of the high-tech labor sector. The above arguments can be summarized in the following diagram:



Blue and red bubbles represent conditions, arrows are the responses, and yellow bubbles label the responses. The arrows imply the response contributes to the condition its arrowhead touches.

The problem is that the industrial culture we are leaving has built up a political structure that functions as a barrier against bringing those at the bottom who need family sustaining jobs to the corporations who need more high paid workers to manage the information crisis they are creating.

## Information and Technology Cycles

So how fast is the automation/information-production cycle? Having no direct statistics, the best indicator that I am aware of is in the growth of technology. There are several indicators that are consistent with the above views.

Moore's law invented by Joe Moore states that roughly every 18 months the processing power of computer cpu's (central processing units) will double. While there is some suspicion that this will eventually end, it is not clear when. It has held true now for at least 20 years. Interestingly enough, according to Jon William Toigo in the May 2000 issue of Scientific American: "Many corporations find that the volume of data generated by their computers doubles every year. Gargantuan databases containing more than a terabyte—that is, one trillion bytes—are becoming the norm ... (4)" This means information appears to be growing in some sectors faster than a major element of information processing technology, processor power.

The concrete ways Moore's law contributes to information production are:

- The workstations that people use respond to the same software faster, allowing more information to be generated in the same time.
- The workstations that people use can run more sophisticated software at the same speed of less sophisticated software, which can in turn generate even more information, much of it of greater complexity.
- Servers (computers that handle large amounts of data) can process information faster.
- Network bandwidth (the speed that data can travel between computers on a network such as the internet) increases. Routers, switches, hubs and network cards, the basic drivers of networks, all use cpu's of some type to do their work. In addition, this last item is not only dependent on Moore's Law. It is also dependent upon other technologies such as fiber optic technology which is also advancing at a dizzying rate. As bandwidth increases, more information can be delivered to more servers and workstations faster, facilitating the overall growth of information flows.

"Cyberimperialism". In order to create chips with higher and higher component densities (this is what makes Moore's law work), newer, more sophisticated and much more expensive factories must be built. It now costs over \$1 billion to build a state of the art chip factory. In order to make a profit on the chips before the factory becomes obsolete, more chips must be produced and sold than previous generations. The way to make sure that happens is to create new mass marketable devices in ever expanding commercial and consumer markets. So we now have not only PalmPilots, we have all kinds of computer game devices, computerized dolls, soon computerized kitchen devices such as internet enabled refrigerators and microwave ovens. (No joke. They maintain automated lists of groceries and can automatically reorder from your net-based grocer when supplies are low.) The only way to preserve profits is to expand markets into newer untouched areas of human culture. This expansion also adds to the information explosion.

Information architectures are also changing. This is also driven by the need to handle more information faster. There are really four main generations of computer architecture(5):

1. Batch processing. This mode of processing lasted from the late 40s to the early 70s. In this mode, punched cards were submitted to a computer operator who ran each program one at a time.
2. Mainframe based transaction processing. This started in the late 60s and still exists in most large corporations though it started losing dominance in the early 80s and has been more or less stable ever since the 90s.
3. Client/Server architecture. This started in the mid-80s and is probably the dominant architecture today. While client/server applications are still being deployed, they are not growing as fast as they once were due to the next item.
4. Modern multi-tiered web-based architectures. This is really a hodge-podge of many different architectures that has taken off starting in around 1997 with the growth of commercial web sites.

While the effect of the spread of new architectures is hard to quantify, it does indicate a new faster information growth trend is now underway.

### **New Employment Niches**

So far we have been talking primarily about employment that directly serves corporate needs. The growth of the Internet is also giving rise to potential niches serving consumers who use the net, the majority of whom are high-tech workers because of their familiarity with the net as well as the amount of money they have to spend.

Consumers, whether they are working for corporations in a particular capacity or just out for themselves, are finding it increasingly difficult to find what they want on the internet. Portal sites such as Yahoo, Excite, Netscape, AOL, MSN and others are one response. These sites are attempting to become the entrance points for all users on the web, providing them with access to both search engines and large indices that help users find what they are after. Shopping portals such as My Simon have also arisen. These sites will allow a consumer to find goods and services offered by a generally large set of online businesses and to comparison shop right then and there. The affect this is having on prices and what the outcomes will be is another very interesting phenomena to watch.

On the other hand, none of the search engines or portal sites can account for any more than about 20% of all of the web pages available. It is still quite common to find "dead urls" (web addresses that no longer exist) when using these sites to find information. As a result more specialized sites are evolving such as Slashdot for the heavy techie or Arts and Letters Daily for those interested in literature, philosophy and opinion. Just as Usenet has provided thousands of sites to host specific discussions, "electronic communities" are forming everywhere with all kinds of specific focuses. In fact the latest dot.com consultants are advising all businesses to transform themselves into electronic communities where consumers interact with each other as well as the corporations workforce to not only buy and sell products, but to actually design and build products.

Another important development is arising and that is for "micro payments". This is a combination of technology for secure buying and selling and arrangements with the financial industry to allow for sites to make money off small payments that may be as low as a tenth of a penny. When this technology becomes ubiquitous on the net, we will probably see a shift in many sites from "free" information (with lots of advertising) to sites with little or no advertising but small fees charged for each access. When you realize that some estimates indicate that there will be over a billion users on the net by the end of 2005 or sooner, you can see the reason for micropayments.



While large corporations that can advertise their sites all over may reap the largest benefits, small providers can benefit just as well. Imagine you are a provider with a very small niche of say 100,000 regular users. If you collect just 10 cents per month from them on average, you will take home \$120,000 dollars/year. As you can see, if you can provide a more unique and specialized information service, you can charge more to a smaller audience and still do quite well. Less specialization implies a lower charge and a larger audience for success. While small specialists will not be able to afford the advertising resources of a large corporation, that may not be important. Larger specialty sites that have established followings are happy to link to smaller more specialized sites to increase their traffic. The smaller sites are thus “electronic symbionts” of the larger sites. This type of spontaneous hierarchy can go a long way and provide millions of niches for small providers. As this evolves, these niches as a whole may be necessary to the functioning of “corporate communities” who will ultimately depend upon good relations with thousands of these smaller communities for business.

As with corporate information management, the growth of these sites is in a positive feedback loop, the more sites there are, the larger the need for newer sites to help people negotiate all the sites available.

How many people are employed by web sites? Unfortunately I have no statistics on this. The range goes from one person for a few hours a week (cy.Rev fits this) to hundreds of people working in several shifts to keep a large commercial site functioning 24 hours a day. Given that there are millions of web sites and thousands of commercial sites and that the commercial sites are just starting to come up, this translates into a large number of jobs. In addition, there is the indirect labor employed by the Internet Service Providers to keep the basic infrastructure working. There are all kinds of graphic artists and writers who are contracted to produce specific content for a site and then move on to other contracts, advertising agencies, consultants galore, trainers, technical book writers and on and on. The point to remember is that we are just at the beginning of the Web as a commercial trend . It is bound to keep growing at a furious pace for at least the next 10 years (and probably a whole lot longer).

### **The Future for High-Tech Jobs**

One conclusion seems inevitable. For people in the high-tech sector who constantly renew their skills, job opportunities will always be expanding. Job related anxieties will not be about finding work, it will be more with deciding what kind of circumstances to work in, as well as completing projects successfully.

The other interesting question becomes what happens to salaries in an economy in a permanent job shortage? Traditional economic views predict disastrous inflation leading to a meltdown. But we are experiencing one of the longest runs of low inflation in history, so that view is probably wrong. While sooner or later the speculative bubble will burst and many stocks will lose their value, I am dubious that this will be anything more than a bump on the road. I think the left needs to do more empirical and theoretical work to understand the new dynamics in the information led economy.

There are no studies (that I am aware of) that demonstrate this positive feedback loop between the information explosion and the need for more high-tech labor. On the other hand, the Bureau of Labor statistics provides some interesting supporting data. The top 5 occupations that are expected to grow the fastest in the period 1998-2008 are all high-tech computer-related jobs(6):

## Employment change, 1998-2008

<b>Occupation</b>	<b>Number (in 1000s)</b>	<b>Percent</b>	<b>Most significant source of training</b>
Computer engineers	323	108	Bachelor's degree
Computer support specialists	439	102	Associate degree
Systems analysts	577	94	Bachelor's degree
Database administrators	67	77	Bachelor's degree
Desktop publishing specialists	19	73	Long-term on-the-job training

Note this table does not imply that these jobs are or will be the most numerous in this time frame. Low paid service jobs will still dominate numerically.

For people who can function in this environment because they have the necessary skills, this new economy is a fantastic promise. You can have the money to live and work anywhere you want comfortably, possibly even without a boss. For those without the background, this is just another opportunity that is beyond grasp.

### **Strategies for the Future**

By a high-tech worker I mean someone who has information manipulation skills using computer technology. At its most basic this means knowing how to use one of the office suites such as Microsoft Office, WordPerfect or Lotus' SmartSuite as well as being able to get around the internet with a browser. In general this also means having the ability to read and write, as well as reasonable computational ability. It should also be obvious that the more educated a worker is the higher the job earning potential.

There are two main barriers to entry into the high-tech job market. The first is education and the second is job entrances or who you know. Progressive strategies that address joblessness need to account for both of these factors.

Traditional left strategies that focus on getting a bigger piece of the pie as well as keeping the pie constructed the same way it was in 1950 have clearly failed and I see no indication this will ever be reversed. Even the UPS workers' recent victory seems to me to be more of a missed opportunity. The union, instead of taking up the cause of part-time workers (as part-time workers) took a more traditional approach. By getting some of the part-time workers upgraded to full-time they won the strike. But part-time workers are expanding at a fast rate, and are being used by UPS's competition. The upshot is that the union managed to avoid the issue of organizing part-time workers, giving management time to figure out how to defeat the union on this issue in the next struggle.

Others argue that we need to reduce the workweek so that more people can obtain full-time employment and so workers will enjoy a better life style. This also seems like a stop-gap. First it still does not address getting workers into higher paying and more stable high-tech jobs. Secondly, it is quite possible that given the pace of automation, capitalists will be able to continue to shrink the labor force even as the workweek shrinks resulting in no net gain for labor.

Dan Swinney's "The High Road(7)" seems to be the strategy best positioned to be able to attack these barriers. Swinney divides the capitalist class into two camps, the high roaders and the low roaders. The high roaders are concerned with providing employment for people to generate new wealth and for a healthy environment. They can be tactical allies when it comes to providing capital to restructure failing enterprises by arranging for worker buyouts, retraining and even capital equipment purchases. The low roaders are driven by a "race-to-the-bottom" focus on short term gain to the exclusion of all else. They are the ones who shut down productive factories in one country to take advantage of starvation wages and totalitarian environments in another. They are the primary constituents of the new transnational class. Swinney's strategy goes way beyond allying with sectors of capital; he involves unions and community groups as the core of the people that need to be organized and empowered to be able to stand independently of any ally. This is why I consider this approach so promising.

Swinney's strategy is critical to stem the bleeding that is now going on in the name of globalization. It does not yet address the dynamics of the high-tech marketplace. I want to make a stab in that direction.

First an anecdote will hopefully clarify the kinds of opportunities that are now opening up as a result of a tight labor market. Entrepreneurial Edge Direct on March 16, 2000 (8) published an interesting article about a plumbing and heating company that needed more help but was hindered by the tight labor market. The owner got hooked up with an organization that taught "survival" language skills and was able to contract with them to provide survival English lessons for 5 newly hired Latino workers and survival Spanish classes for his 65 English-speaking workers. This became a major boon to his business. It seems doubtful that this would have come about in anything other than a tight job market. Employers are loath to cross racial and/or language lines unless they are desperate. But under these circumstances not only did normally left out Latinos get some jobs, a new service company grew too. Survival language skills are probably not going to do well in a loose labor market. This is an example of how a tight labor market not only provides entrances to new jobs to the traditionally left out. It also provides opportunities for labor service organizations that did not exist before either.

The basic model is to grow politically and economically independent and self-sustaining organizations built up around gaining access to the high-tech workplace. As in Swinney's model, this means reinvigorating unions and giving them back to their membership. It also means building alliances with community organizations and other institutions that have a stake in the success of the oppressed. In addition it means struggling for democratic and civil rights and advocating economic and civil policies that are consistent with the needs of the overwhelming majority. It means struggling to be heard, which is increasingly difficult in a world dominated by huge transnational media monopolies.

This, in many ways, this model resembles the "Serve the People" approach of the Black Panthers. As you recall, the Panther strategy was derived from revolutionary third world strategies to build a self-sustaining independent base from which to operate. Impoverished and oppressed, the Afro-American community was marginalized even when employed, numbed by welfare and deadened by gangs and drugs. While the attempt to build that independent base failed, it failed because the State was fearful of its success. Cointelpro, other parallel actions by law enforcement and media hysteria all succeeded in destroying the Panthers. This shows how difficult it will be to establish such a base.

One of the reasons for this difficulty is that now the new Transnational Capitalist Class (TCC)(9) is asserting hegemony over national governments that in the first place were never oriented to helping the oppressed. This class is even more predatory than the earlier national bourgeoisie of the advanced

nations and is completely focused on short term gain. Independent economic and political organizations not dominated by the TCC are considered threats; and national governments are charged with disposing of those threats.

Developing a revolutionary base among the oppressed is only one aspect of developing a revolutionary strategy. This paper is focused on this aspect because of its relations to the question of jobs. I am not attempting to claim that these ideas constitute a whole revolutionary strategy. The following points, however, need to be addressed in an overall strategy:

Reforms to bridge the digital divide are not enough. Gaining access to technology is clearly important for oppressed groups, but it is not sufficient to provide meaningful jobs or to provide an independent political and economic base to contend for power. Reforms to bridge the digital divide are not enough. Gaining access to technology is clearly important for oppressed groups, but it is not sufficient to provide meaningful jobs or to provide an independent political and economic base to contend for power.

Unions and community groups need to become high-tech learning centers and to go after alliances with venture capital to form high-tech incubators. These institutions are a critical need in the inner city. Poor and minorities without any experience have a much harder time breaking into good jobs. Nobody knows who is behind a web page or where they are located. It should be possible to start all kinds of businesses that serve the base communities and are profitable. These businesses can grow and become independent and also provide much needed on-the-job experiences for members of depressed communities. Again, if a progressive organization such as a union or community organization is behind this, there are ample opportunities to build a political base.

Unions that adopt these ideas could not only provide jobs for their members, they would be in good position to be an employment resource, a place that employers would go to find qualified staff. This would make it easy to negotiate for better salaries, working conditions and benefits since they would be holding scarce resources in a tight market as opposed to now when they are holding resources of diminishing value both economically and politically. This would also be a good way for unions to again become a major political force on the rise.

Unions and community groups also need to create partnerships with local colleges and universities (knowledge-based social capital). Educational institutions need to provide classes at an extreme discount or for free in exchange for a piece of the action from the profits that come from the incubator. While scholarships and loans can be important, this idea makes the educational institutions invested in the success of their students and the incubator and thus also invested in the economic success of the community. This can have important political ramifications to the community's benefit since the educational institutions can drag in many other players who can become allies (even if the amount of commitment varies).

Progressive organizations with access to workers need to become conduits for needed educational services. By using the internet, many classes can be taken in circumstances where the environment can be set up to insure greater success, especially for single mothers or for people who have to care for injured or disabled family members. Education should be on a broad continuous basis. This is because not only because technology changing rapidly, but because more educated workers have more intellectual facilities to bring to bear in a job and that provides competitive advantage. Finally, continuous education means more opportunity for organizers to interact with the base, especially if the educational environment is under the auspices of a progressive organization.

Controlling access to high-tech workers also means unions and community organizations can have influence on the deployment and direction of high technology itself. Why should high-tech businesses only serve the interests of the TCC? Why shouldn't these businesses be better for the environment? Why shouldn't customer sensitive web businesses be concerned about the fact that a large base of customers wants more democracy and real news not just a backdrop for advertisements? Building up a strategic base will have profound consequences for the exercise of power in this new world. Not building this base will have equally severe consequences in the opposite direction.

## **Conclusion**

The new economy is upon us. There is no going back. Rather than looking for progressive models from the past to guide us, we need to strike out in new directions. Through a "concrete analysis of concrete conditions" today, we need to determine a strategy and tactics to combat rapacious capitalism in its modern form, not as it was 100 years ago. Organizing the industrial proletariat to remain an industrial proletariat is a rear guard action. It is still important as long as there is an industrial proletariat, but helping the millions who are excluded or about to be expelled from the global economy obtain lives they can live in dignity and justice must be our priority. We can not do this just by saving industrial jobs, we need to transform people into modern high-tech workers using a progressive, high road agenda.

## Notes

(1) <http://www.nytimes.com/library/financial/sunday/022700biz-atlanta.html>

(2) <http://www.examiner.com/000209/0209visas.html>

(3) Typically classification can occur before entry in a scenario similar to the following: A new engineering modification is to be created, before the modification design can start a change request id must be generated by the system. A record with the identifier and classifying information is created and placed in a system as a place holder so that other engineers can see what other changes are being requested even though the request is not yet complete.

(4) <http://www.sciam.com/2000/0500issue/0500toig.html>

(5) These architectures are defined primarily by their use of database technology with the first phase being the most primitive. Mainframe databases never really standardized though it seems safe that the combination of CICS and VSAM has ended up as the dominant trend. Client/Server is primarily defined by relational database technology and the Structured Query Language (SQL). Object oriented databases supporting XML seems to be the common trend in the most advanced of the web based technologies. XML adds a new dimension of "unstructured" or text based information to the mix in ways that can not be accomplished in a client/server environment (though Oracle and IBM are trying very hard to dominate this area with their older database technology).

While arguing that the new multi-tiered "pure" XML solutions are clearly the most efficient and will very soon come to dominate information management will appear contentious especially to the many software companies that depend on the older client/server architecture, it seems like a safe bet. Part of the reason for this is the incredible growth of XML that is being driven by the W3C which is an industry standards group that guides the development of the internet as a whole.

One of the distinguishing features of this new era in computing and all other eras is that in this era standards bodies are leading the technology sector forward while in previous eras, dominant corporations were. This is due to the fact that the web is the first technology that has created real head-to-head competition in the computer marketplace. Before the web, computer systems were islands to themselves and vendors could capture market share by getting a corporation to buy their hardware and/or software. This would keep many other vendors either out of the corporation or at least lower their footprint drastically. With the web, there is no way to isolate your technology so the expansion of the web depends upon the existence of industry standards that all vendors adhere to.

An aside is that Microsoft's monopoly problems have to do with how it dominates the client side of the client/server technology. Even Microsoft has been forced to adhere to W3C standards as a condition of its existence in the new technology marketplace.

(6) <http://stats.bls.gov/news.release/ooh.t01.htm>

(7) This can be purchased from The Center for Labor and Community Research for \$10. See [http://www.clcr.org/lst\\_publications.cfm](http://www.clcr.org/lst_publications.cfm)

(8) [http://edge.lope.org/main/direct/ELR\\_spanish.htm](http://edge.lope.org/main/direct/ELR_spanish.htm)

(9) See Transnational Capital Faces Nationalist Challenge by Jerry Harris or Fissures in the Globalist Ruling Bloc? by Jerry Harris and Bill Robinson