

AMERICAN ENGINEERTM

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Dissident Engineer

THE HOLLOWING OF THE U.S. ECONOMY

A good article titled, "The Hollow Ring of the Productivity Revival," by Stephen S. Roach, appears on page 81 of the November-December 1996 issue of the *Harvard Business Review*. The executive summary of the article, appearing on page 203, states,

The U.S. economy has been on the upswing for more than four years. Inflation is low, corporate profits are up, and the stock market has risen beyond anyone's dreams. Such changes are the byproduct of the wrenching restructuring undergone by corporate America over the past decade—changes that indicate an apparent leap in productivity. But the picture may not be so rosy, warns Stephen S. Roach, chief economist of Morgan Stanley. The boost in productivity in recent years has been achieved by cost cutting, in particular, downsizing. And cost cutting does not produce real long-term gains in productivity. Rather, it leads to one-time increases in efficiency, as the surviving members of a workforce generate more output.

The article itself states (page 87),

The demand side of the global economy is about to enter an era of geometric growth. It would be ironic and tragic if revitalized U.S. companies squandered the fruits of restructuring by continuing to downsize their capabilities on the supply side. The hollowing strategies of the 1990's may be setting just such a trap.

Apart from a potential loss of global market share, there is another more immediate peril if businesses continue to fixate on downsizing. Workers' loss of income because of layoffs and stagnant real wages could turn out to be a decisive impediment to final demand in the United States. In their attempts to boost efficiency, companies are putting extraordinary pressures on household purchasing power. The upturn in personal consumption in the current recovery has been the weakest of all the recoveries of the post-World War II era. Furthermore, as a new sense of economic anxiety takes hold in an era of downsizing, falling consumer confidence could retard growth in spending all the more and undermine the very demand base that newly restructured companies are now attempting to penetrate.

A major fallacy of the downsizing strategy is the implicit assumption that the resulting losses of consumer purchasing power and consumer confidence are not sufficiently great to offset the benefits of the downsizing. That assumption might be valid if only one company were downsizing, but, of course, many companies have the same idea.

It is common for downsizing to bring short-term gains at the expense of long-term competitiveness. However, in our economy, corporate executives are typically rewarded—and rewarded handsomely (compensation of executives compared to that of other workers is at a historic high)—for short-term gains, so the popularity of the downsizing strategy should not be surprising.

The article also says (page 89),

Make no mistake, the productivity dilemma in the United States cannot be resolved by the quick fix of reflationary monetary and fiscal policies. Such prescriptions are premised on the erroneous conviction of policymakers that they can calibrate growth, inflation, and unemployment targets with near-scientific precision. If there's one thing that history clearly indicates, it is that such efforts are always doomed to failure. Consumers and businesses cannot be fooled by fine-tuning, which inevitably leads to higher inflation. And once the inflation genie is out of the bottle, it takes a wrenching monetary tightening to contain it, which creates, in turn, sharply rising unemployment that can only exacerbate the pressures of sub-par productivity and economic anxiety. For ~~that reason alone, fiscal and monetary policies are~~ not a substitute for more effective strategies of productivity enhancement.

One major reason why policymakers cannot fine-tune the economy is that the costs of unemployment in particular are not evenly distributed, but are disproportionately borne by the unemployed, particularly the long-term and chronically unemployed. And once someone has experienced the anxiety that frequently results from long-term unemployment, that person's confidence as a consumer becomes particularly difficult to restore.

The article does have a serious flaw: it is overly gloomy about the decline in students' SAT scores, failing to note that a major cause of that decline has been the increase in the proportion of lower-achieving students taking the SAT.

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High-Tech Immigration Sparks Debate

By Robert Bellinger

Stanford, Calif. - "A society can't have too many highly skilled, highly motivated people," according to Cato Institute analyst Stuart Anderson.

Or can it?

"The bottom line," said professor Norman Matloff of the University of California, Davis, "is these employers are not willing to hire Americans with 10 to 15 years' experience. They say they need people with the right skills, but should they be insisting on a laundry list of the latest hot skills? I maintain they should not, because any computer programmer can pick up a new software technology in a month or so."

Anderson and Matloff were among the speakers at a conference on immigration policy last month at Stanford University.

Sponsored by the Hoover Institution, analysts, industry leaders and pro- and anti-immigration reform advocates debated the impact of legal immigration on the American workforce—particularly in the high technology industry.

"High tech is blind to the concept of immigrant," said Joseph Costello, chief executive officer of Cadence Design Systems, whose international workforce is 40 percent American. Costello said U.S. employers can't find enough skilled people, and will move offshore if they have to.

American engineers, he said, "are competing with every other engineer in the entire world, and it's an ultimate test—do your skills stand up?" Cadence opens development centers wherever it finds a concentration of skilled people, he added, and has groups in Boston, India, Taiwan and Scotland, along with its headquarters in San Jose. "Silicon Valley is also very

unstable, in terms of the high turnover of engineers," he noted.

Older EEs hurt?

Matloff contended, however, that Valley employers are ignoring older engineers who may need some retraining to get up to speed. IEEE-USA has made the same point in other debates, noting that EEs and computer scientists can pick up new technologies or languages quickly with some training.

However S3 Inc. chairman Dado Banatao, an immigrant from the Philippines, said startups can't afford retraining. "In a small company, you can't learn on the job. You have no time."

Banatao is an example of immigrants who end up creating jobs in the United States: he's involved in five other high-tech companies. Some of the biggest companies in the Valley were founded, at least in part, by immigrants.

He acknowledged, however, that better job-market forecasting is necessary. "Something has to be done in forecasting for the next 10 years. Otherwise, I think that just like manufacturing, R&D will move out."

EE Times readers generally agree with the industry leaders. In the 1996 *EE Times* Salary & Opinion survey, 60 percent of the readers said that present legal immigration levels should not be cut back.

The Hoover Institution plans to issue a summary of the two-day conference in February or March. A press release on the conference can be found on the Web at www.stanford.edu/news/release/961022immigrate.html.

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Editor's Column

ILLUSORY JOB ADS

I'll continue this segment of Editor's Column as long as there are job ads that list a state employment service (thereby concealing the employer's identity), offer sub-standard wages for lengthy job requirements, comprise a biography of the intended applicant, were obviously written by an immigration lawyer, and often contain the phrase that is a giveaway of intention to hire an alien instead of a U.S. engineer - "Must have proof of legal authority to work permanently in the U.S." An alternate strategy could be the demand for an SS number (see ads below). Tell me if that's equivalent.

Electrical Engineer: Engineer Programmable Logic Controls (PLC's) and man-machine software for security systems; project management and security systems design; travel 8-12 weeks per year to customer sites. Must have a B.S. degree in Electrical Engineering or Electrical Engineering Technology. In completing bachelor's program, must have acquired knowledge of AutoCAD, project management, and PLC's. 40 hrs/wk; 7:00 a.m. - 4:00 p.m.; salary of \$33,000/yr. Send resume with Social Security No. to Indiana Dept. of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277,

Attn: Gene R. Replogle. In response refer to Job Order #3450408.

Here's an even more rigorous job ad with salary well below prevailing wage and demand for skill in the hot technologies:

Network engineer: Must design and develop systems software to be used on a datacommunications network switching system using HTML, C, C++ languages. Graphical User interface and Transmission Control Protocol/Internet Protocol (TCP/IP). Provide hardware and software support for datacommunications network switching systems. Develop and perform software diagnostic testing and fault analysis for line card modules. Maintain datacommunications equipment, including, hubs, routers, and bridges using ControlPoint HP and Open View software tools. Interface with customers to identify and resolve system problems. Establish system backups and implement recovery procedures to ensure data integrity. Maintain and monitor network security by implementing HP/UX NIS Server for centralized user account and password administration. Install and update HP/UX operating system software. Develop and maintain software utilities needed to support

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system management functions and increase user friendliness using Shell Script, C, and C++ program code. Requirements: B.S. in Computer Science, or Computer Engineering and one year experience in the position offered or one year experience as a Network Engineer or Manager/Data Communications which must include supporting Data Communications Network and Troubleshooting hardware and software problems involving TCP/IP Protocols in a HPUX environment. M-F, 8:00-5:00, \$39,000/year. Apply at the nearest Job Service office, or send resume with Social Security number to the Job Service, 1105 Briggs Avenue, Durham, NC 27703, J.O. #NC3062179 and DOT code 030.162-014. AD paid by an equal opportunity employer.

If there's a shortage of engineers, as some industry spokespersons would have us believe, how can this company obtain all that talent for that salary? My contention is that there's only a shortage of cheap engineers. Are you cheap? Will you have to learn how to be cheap (shorter vacations, cheaper colleges for the kids, don't eat out often, live in a cheaper neighborhood, etc.)? What, if anything, does this motivate you to do?

PHD POPULATION CONTROL

Are scientists more intelligent than engineers? I suspect not, but there are some signs that they have more enlightened self-interest. A reader sent me a copy of an article in the 10/6/95 issue of *Science*, entitled "Is It Time to Begin Ph.D. Population Control?" Admittedly this article is about 1.5 years old. But it carries a message that I fail to see in engineering journals on professional concerns (except this journal). The message is that there are too many PhDs, which causes problems of employability. In a '95 report issued by William F. Massy of Stanford University and Charles A. Goldman of RAND Corporation, the authors claim the "natural production rate" of science doctorates exceeds the demand from all sources by about 22%. Of course the article talks about scientists, not engineers. And it was written at a time, when the Dow was not as high as now, and the rate of Initial Public Offerings (IPOs) was lower than now, High Dow and high rate of IPOs lowers unemployment for the technically trained. But the fact that Massy and Goldman raised the issue of supply versus demand for scientists is a breath of fresh air.

I can hear the reader say that these are boom times for engineers. Well there are lots of job ads, at the same time as lots of layoffs. And consider 1994, when there were about 103K engineers graduating from all U.S. colleges at the BS, MS or PhD level at the same time that U.S. engineering unemployment exceeded 4%, or about 79K souls! The only place I read that it would be beneficial to publish recommended limits on entry to engineering was in my writing. A recommended limit would not directly limit entry, but it would dramatise the problem. Even this mild suggestion was visible no where else, but in stuff I wrote. Do engineers understand that the price of a service depends on the shortage or surplus of that service? This is the law of supply and demand. Would you rather have few or many competitors for the job you apply for? Of course universal registration would also be a filter on entry to the field (besides protecting the public interest). Any mechanism that reduces an excess of any commodity is of benefit to the purveyor of that commodity. Tell me what you think of this simple economic theory.

Reach Out

Reach Out to the active volunteers that are making this publication possible. Tell them what you like or what you dislike. Provide them with questions, answers and information or just a hand written note of appreciation. Believe me when I tell you that it is important to let your volunteers know that you care. Reach out to the following:

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- Richard Tax, AEA VP, General Information**
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KMET's KORNER

... Perspective on Time-to-Market

By Ron Kmetovicz

President, Time to Market Associates Inc., P.O. Box 1070, 100 Prickly Pear Rd., Verdi, NV 89439; (702) 345-1455; fax (702) 345-0804.

My December 2nd column generated considerable feedback. The column offered two suggestions, which I repeat below, to consider instead of conducting an engineering layoff when a business declines. I recommended:

- Reducing operating expenses to a minimum.
- Placing the engineering team on a reduced-work schedule for reduced-pay program.

The measures function for a short period of time, up to six months, and should only be applied when an optimistic vision for recovery exists.

Readers jumped to attention on issues of fairness. What about the management team? Should they take a pay cut? Certainly, a case could be made that mismanagement may contribute to poor business performance. Or what about the marketing team that read indicators incorrectly? It is possible this cast of characters placed the company in dire straits. Maybe the folks in sales could get their act together and do what they were supposed to do? Possibly manufacturing could build it right and sales would go up?

Thinking this way places complex and interactive issues in view. Does the engineering team sacrifice alone while others go on working at full funding and full pay? Certainly not! The column, however, did not comment on those who work outside of new product development. Actions taking place prior to adopting the two recommendations may include:

Reducing the number of managers in proportion to business difficulty. This is done by looking at organization charts while counting the number of layers between the executive staff and the individual contributors. In the not too distant past, four or more layers were visible. Now, reengineering specialists recommend a two-layer structure. One layer consists

of the executive staff and the second manages individual contributors. The action virtually eliminates the middle-management structure. Next, the remaining management layer consolidates by placing more decision making responsibility with direct contributors. In theory, the organization empowers those doing the work to guide their own actions.

Systemizing the work previously performed by managers. Concurrent with the management exodus, the remaining managers and contributors learn to apply new systems and tools to perform routine managerial duties. The systems and tools, most based on database structures, rely on the input of quality data. Data manipulation over company networks then makes it possible to serve the information needs of executive managers, managers, and individual contributors. Caution is advised here. The systems and tools must equal, or exceed the performance of the managers being replaced, at reduced cost. If not, remaining participants should expect continued business erosion.

Managers setting the example by taking a reduction in pay. Managers do what they ask of their employees. If working with less for less is the order of the day, they lead by example.

The company must have a vision on how to work its way back to prosperity. If the vision exists, and it includes new products, then the application of the two recommended actions places the business in an excellent position to recover. The business' likelihood of returning to prosperity lives with its product developers. The actions outlined preserve this fundamental corporate asset to set the stage for recovery. Hopefully, the distribution of the unavoidable pain and suffering retains some degree of fairness.

To obtain an e-mail copy of "The Complete List of Reasons for Late Product Information," contact Mr. Kmetovicz at kmetovicz@aol.com.

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Reader's Voice

This column in the "American Engineer" is for readers to voice an opinion about issues that affect the professional life of an engineer or other technical professional. Readers are encouraged to write AEA with their professional concerns. Each submission should include the name, address and phone number of the writer. Except for short excerpts, we'll publish the writer's name, city and state (unless the writer requests anonymity). In that case, we'll publish initials, city and state. Let's hear from you.

From Fred Harris of Palo Alto: - I'm a newcomer to AEA, and I greatly enjoy your newsletter, *American Engineer*. I appreciate your attention to issues of job security for engineers. I am enclosing an ad that has been running for the past few weeks in the *San Jose Mercury News*, that you

may want to discuss in one of your columns on job ads for foreigners. Perhaps I'm being over-sensitive, but this ad seems to convey a message as to whom this employer would like to have apply for these jobs. (The main message is the desired race, ethnicity, and age bracket of applicants.) I would like to lodge a formal complaint with some government agency about the ad, but I don't know who to call. If you choose to write about this ad, perhaps you could suggest what actions might be taken by individuals who encounter such things.

Editor: Toshiba America Electronic Components, Inc. ran the ad to which Mr. Harris refers, so the employer's identity is not concealed. It lists nine job categories for which they seek applicants. It does not have telltale phrases like 'must have

proof of legal authority to work permanently in the U.S.' It also does not stipulate a ridiculously-low salary. The only feature of this ad that makes me wonder who are the desired applicants is the presence of a 10X10 CM photo of a young, smiling Asian, with the caption "You're TOSHIBA." I don't know if this constitutes a violation of Labor Department rules, but it might be worth writing the Labor Dept. at 200 Constitution Ave., Washington, DC 20210. It is interesting to note that present Dept. regulations do not permit them to investigate an ad suspected of violating their rules. Any investigation they undertake must be 'complaint-driven.' Also the Labor Dept. is so understaffed that they rarely check the ads on their own. They do not examine the salary offers for believability; a \$33K salary for an engineer with experience does not raise eyebrows at the Dept. This is not to criticize the Dept., which is, as I said, understaffed for this sort of rigor. If Congress allocated more funding, the Dept. could do more. But the present thrust is for less rather than more government.

From PJC of Bayside, NY: - I apologize for responding so late to the 6/96 issue of AE. The reprint article entitled "Over-paid?" by Bob Bellinger of *EE Times* caught my eye. It quoted a Penn State prof who said, "U.S. engineers are being over-paid in a globalized economy. There are no ifs, ands or buts about it." What the Penn State prof should realize is that the same can be said of college professors, policemen, doctors, politicians, and corporate executives. The only difference is that some of these persons do not have to compete with foreigners, so their comparison with global wages is irrelevant. I think the Penn State prof is not seeing past his nose and is just picking on engineers.

From L.F. of L.A.: - Nearly 10 years after initial publication, the misleading "net new worker" statistics of the Hudson Institute's 1987 Workforce 2000 report continue to promote the myth of a 'shortage' of white male workers, particularly new white male workers. An article titled, "Get Serious About Diversity Training," on page 39 of the 11/25/96 issue of *Business Week* began,

"During the past decade, Corporate America has spent hundreds of millions of dollars trying to effect racial harmony. Why? In part, the legacy of the civil rights movement demanded such an effort. More than that, though, changing demographics made such an effort urgent. The Hudson Institute's 1987 Workforce 2000 report made that stunningly clear. Its conclusion: Minorities would make up more than half of net new entrants into the labor force by 2000."

The ambiguous term, "net new entrants," from the *Business Week* article, refers to workforce growth, i.e. the numerical difference between workforce entrants and workforce leavers. Hence Workforce 2000 predicted that the numerical growth of minority workers would equal more than half of the numerical growth of the entire workforce by year 2000. However employers hire real, live new workers, not abstract growth statistics. And the U.S. Dept. of Labor's 11/91 Monthly Labor Review, page 41, predicted that minorities—including Hispanics—would make up only 34.7% of workforce entrants in

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the period 1990-2005. In recent years, the myth of the 'shortage' of new white male workers—the so-called 'traditional' source of new engineers—has been a major underpinning of the engineer-shortage myth. One of the main fallacies here has been to ignore the heavy representation of non-white Asians in engineering.

Robert Bruce, AE Editor

P.O. Box 620-726, Little Neck, NY 11362

Letter to Editor of EE Times

U.S. Industry places little value on experience in the trenches

I just read Cathy Wade's letter (see Nov. 11, page 30) and have to chime in. It has long bothered me that engineering is one of the few professions where your success is measured by how quickly you get out of engineering. The young "hip-pot" hotshots are quickly moved into management and are then held up to the rest of us as examples of the wonderful opportunities that are open to us, if we would only apply ourselves.

Meanwhile, the newly minted managers are making decisions without any real experience and are telling the grizzled veterans the right way to do things because "it always worked for me."

And the worst thing to do is to tell them that their ideas won't work in the real world. Then you're just "hide-bound," "opposed to progress" or (worst of all) "not a team player." The fact that you've been there and tried that is irrelevant.

Tied into all of this is the fact that American industry places no value on the experience gained by years in the trenches. Management always seems to think that somehow it is cheaper to pay a recent grad a lower salary to make the same mistakes that have been made dozens of times before than to pay a little more for an experienced engineer who will do the job faster and better by avoiding the mistakes in the first place.

I have also long gotten amusement from my school's alumni magazine touting the successes of engineering graduates who got out of engineering as soon as they could. What you have to realize is that working engineers don't make large contributions to the school's fund-raising campaign; corporate executives have far more money to use to buy the good publicity. The universities know very well how to suck up to the people with the money.

Those are the realities, however. We either live with them, or we join the ranks of those who have left engineering to go on to "better things."

Robert Mason, Staff Engineer

Square D Company, Raleigh, N.C

On the Internet

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Disillusioned Engineer

THE FOUR-YEAR QUESTION

Two adjacent articles in the October 1996 issue of the *Journal of Professional Issues in Engineering Education and Practice*, published by the American Society of Civil Engineers, had completely different answers to the question of whether four years of college is enough time to prepare for an engineering career. The first article, titled, "Engineering Education: Paragon or Paradox?", on page 147, said,

Engineering remains largely a profession based on a baccalaureate education while most other learned (and licensed) professions have some graduate education requirements based on a general undergraduate program. The model for engineering should include at least the master's degree in order to ensure inclusion of the most essential elements of education preparation. the educational requirement for licensure should be dependent on graduation from an accredited program at the master's level, and not on some further examination (supposedly aimed at confirming the result of accreditation).

The next article, on page 151, titled, "Integrated Civil Engineering Curriculum: Implementation and Management," told of efforts to design a new 4-year program at Colorado State University, and stated that a "followup paper will describe the lessons learned for the benefit of departments trying to improve design instruction, while adding new material to an already overcrowded curriculum and retaining flexibility for

students to graduate in four years." (Emphasis added) Adding new material to an already overcrowded curriculum?

The "Dissident Engineer" column on page 2 of the September 1996 issue of this newsletter stated,

There would be much more flexibility in redesigning engineering curricula if the four-year straitjacket were done away with, and programs allowed to expand to five or six years; but to do that would require revolutionary changes in the entire engineering profession: the rewards of an engineering career would simply have to be made commensurate with a longer program, i.e., age discrimination, salary compression and inversion, job insecurity, etc., would all have to be eradicated.

Also, the question of adding a year or two to basic engineering education often seems trivial in view of the many engineering-career years that many engineers have lost as a result of unemployment, underemployment, career switches, and early retirement.

Also, an examination requirement for licensure serves purposes other than merely "confirming the result of accreditation" (see first quotation above). These are: (1) providing an engineering licensure path for those who do not have engineering degrees; and (2) providing a basis for comparing the quality of graduates from different engineering programs.

Tips On Investing

By Henry Wiesel

Engineers and technicians all want to earn more on their investments. An attractive opportunity now exists in preferred securities.

Preferred stocks and related securities have become the investment of choice for those seeking higher yields, solid credit quality, and name recognition in the taxable fixed-income markets. Preferred issues are particularly appropriate for those in low- to moderate-income tax brackets who want a higher current income, like many retirees. They also make a lot of sense in tax-deferred accounts.

Preferred stocks are nonvoting equity securities in a corporation, but have debt-like characteristics—a fixed dividend, for instance. Most preferred securities are perpetuities, but are callable at par, generally about five years from issuance. Some of the newer hybrid preferred structures are not technically considered preferred stock, but they perform similarly. Features common to all structures in the preferred securities sector include:

- Attractive yields relative to other fixed income alternatives and common stock equivalents.
- Monthly or quarterly income stream.
- Solid credit quality.
- Low minimum investment.
- Liquidity in the secondary market. Most preferred issues

are listed on the New York Stock Exchange, enabling investors to price and trade their preferred securities conveniently.

The most traditional preferred stock structure is perpetual, meaning that there is no stated maturity and the fixed dividends will be paid indefinitely unless the issue is called. However, issuers can retire outstanding preferred issues through call provisions, usually in five to ten years after issuance. If interest rates are lower once the security becomes callable, the call will undoubtedly be exercised.

Besides "straight" Perpetual Preferred Stocks, there are Adjustable Rate Preferred Stocks, Yankee Preferred Stocks, and several newer structures:

Exchangeable Capital Securities (ECS)
Monthly Income Preferred Securities (MIPS)
Monthly Income Debt Securities (MIDS)
Quarterly Income Capital Securities (QUICS)
Quarterly Income Debt Securities (QUIDS)
Trust Originated Preferred Securities (TOPRS)

These newer hybrid structures are either technically considered debt or are comprised of debt components, and are structured with maturities ranging between 20 and 50 years. These issues tend to be priced to yield 1/2% to 3/4% more than similar "straight" preferred stock.

Note: MIPS, MIDS, and QUIDS are service marks of Goldman, Sachs, & Co.; TOPrS is a service mark of Merrill Lynch & Co.; and QUICS is a service mark of Lehman Brothers Inc.

Henry Wiesel is a Vice President, Financial Consultant, and Qualified Pension Coordinator with Smith Barney. He provides investment accounts nationally and internationally for individuals and corporations. Readers are invited to contact him to receive a free copy of the Smith Barney Brochure on "Preferred Securities." Mr. Wiesel may be contacted at Smith Barney, 1040 Broad St., 2nd Floor Shrewsbury, NJ 07702; (800) 631-2221, Ext. 8563.

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TRUDEL to form

By John D. Trudel

My last thread for this column—Where did the good jobs go? Where does prosperity lie?—provoked an unusually deep response. I got some VERY thoughtful three- and four-page letters. Thank you for sharing your thoughts and concern.

Some seemed to think, incorrectly, that the Information Age precludes building things. They see it as a virtual wasteland of techno-geeks moving bits around and generating only printouts and pretty screens. A typical comment, received by snail mail, was "Computers and the information web may do wonders on a screen or in a printout, but some time later, something has to be fabricated out of some material."

Perhaps the end products are built, at least in part, from physical things. What matters is that the value is added through knowledge.

Imagine a company staffed by a band of competent, but naive, engineers. They invent the "better mouse trap." They get lucky. The world covets their device and a huge market exists. Unfortunately, the creators neglect to protect their intellectual property through patents, copyrights, and trade craft. What is the likely outcome? A) The company prospers, or B) The company goes bankrupt or is acquired.

In most cases the correct answer is "B." Consider the devices that have made the most money in the past few decades: fax machines, CD-ROMs, and VCRs. These were physical products invented and productized by Western firms. In all cases, the creators were driven from the market and the money was made by others.

In today's world of fast communications and global competition, it is often cheaper to clone products than to develop them. Technology theft and reverse engineering have become an art form. The Patent Sell-Out that I have been warning about will make these rip-offs easier.

There are three proven ways to steal products. The Chinese way is simplest. They just copy the products and build them

with slave labor. That's illegal, but it works.

The U.S. way is clumsy, but legal. First you hire a bunch of lawyers. Then you form a team of "dirty" engineers to copy the product and reduce it to a functional spec. You have your lawyers form a "clean" team of "virgin" engineers, who can testify under oath that they have no knowledge of the product being copied. They work in a "clean room" and implement only from the functional spec. In a few months or years, a copy emerges.

The Japanese way is effective, elegant, and legal. They protect their local market through subtle "understandings." They ensure that their patent system favors national interests. They lobby aggressively and place agents in our top commerce positions. They relentlessly seek cheap technology access and early warning of key inventions. They "cluster patent" around competitors. In key cases, they "dump" (sell below cost) to destroy competition. This forces Western competitors to exit the market, pay royalties for their own inventions, or license their rights cheaply.

Firms damaged or workers that were laid-off because products were pirated can't get much sympathy. Intel, the inventor of DRAMs, got no help from Washington, even when the Japanese were flagrantly dumping memory chips. Intel prospered by moving to microprocessors—physical products defended in depth by strong "Information Age" intellectual property protection.

Note that nowhere have I suggested isolationism or more government regulation. The present bipolar political debate on this topic is hollow. Megastate bureaucracy is not the answer.

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Professional Pipeline

By Robert Bellinger

BOA SQUEEZES BEAN COUNTERS

If you saw our Sept. 2 "Pipeline," you realize what a great response we got to our "Mickey's" columns about cheapskate tactics companies use to save a buck. Every bulleted item came from readers, who swear it has happened to them.

We're still getting more Mickey's, but I think we've all gotten the idea by now—demanding requisition slips for Post-it pads (eked out one at a time), charging money for the corporate picnic and handing out candy canes in lieu of a Christmas bonus is no way to run a company.

What these examples really illustrate are the dangers of millmanagement and nanobean counting. Instead of focus-

("Professional Pipeline" continued)

ing on growing the company, the managers have resorted to squeezing the boa until it disgorges the last rat it ate. Instead of scouring the customer premises for unfulfilled market niches, the micromanagers of industry are scurrying around employee cubicles, picking off scraps of stray alleged wasted pennies.

Growing the Markets

What the micromanagers don't realize is that the next meal lies out in the field, holed up in a customer's factory, gnawing away at the customer's profits. Grown-up companies understand that while expenses need to be kept in line, survival depends on growing their markets, not "disconnecting the long distance on all company telephones." Jeez. Talk about wrapping that now-hungry boa around your neck.

The Mickeys also reveal engineering companies run by bullies.

Who conjures up policies that, in the words of one engineer-contributor, make the company "lay off 10 percent of the people every quarter to 'keep people on their toes'?" On the edge of their seats, perched to flee for the nearest exit, is more like it.

Who dreamed up the idea to fire a new father who trims back his schedule to 40 hours because, in the words of one reader, "he was not committed to his job"? Scrooge, that's who. Someone dispatch a virtual Marley in clanking chains to that Bullyboss, preferably on the Friday after Thanksgiving—a workday at some readers' employers.

Grown-up companies—and thank god, we DO have a nice batch of them in the technology world—understand that their engineers are the "crown jewels" of their companies. You don't complain about them weighing heavily around your neck; you show them off. Handled properly, they'll shine, increasing in value as the years go by.

I don't expect too many micromanagers will recognize themselves here. Some readers did. "It is scary how many of the examples I have encountered of these 'Mickys.' I was expecting to go down the list and only relate to a few. I estimate a 30-percent hit rate, either personally or from reliable sources," said one reader, who added: "How do these messed companies manage to stay in business and get away with this for so long????"

It was gratifying to get this e-mail: "A brief note of thanks for your article in *EET* on horror stories from the EE field, which my EE roommate had shown me. As a manager in a different field, I'm trying to avoid becoming a jerk, and the examples you accumulated are a terrific reminder of what managerial ignorance can do."

May your next company picnic be free.
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