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The American Engineering Association is very pleased to announce the appointment of former U.S. Representative Helen Delich Bentley (R. Md.) to our Board of Advisors.

BENTLEY, Helen Delich, a Representative from Maryland; born in Ruth, White Pine County, Nev., November 28, 1923; attended the University of Nevada, and Georgetown University, Washington, DC.; BA., University of Missouri, 1944; journalist; television producer; chair, Federal Maritime Commission, 1969-1975; international business consultant; unsuccessful candidate for election to the Ninety-seventh in 1980 and Ninety-eighth Congresses in 1982; elected as a Republican to the Ninety-ninth and to the four succeeding Congresses (January 3, 1985-January 3, 1995); was not a candidate for reelection to the One Hundred Fourth Congress in 1994, but was an unsuccessful candidate for nomination for Governor of Maryland; unsuccessful candidate for election to the One Hundred Eighth Congress in 2002.

Mrs. Bentley was very supportive of AEA and our issues during the time she was in Congress. There was a famous photograph of Mrs. Bentley with a sledgehammer breaking up a Japanese “boombox”. She has been concerned with the loss of American jobs for many years.

She marched in a COMDEF protest at Crystal City, Va. in October 1987 protesting the arms show displaying foreign made weapons and weapons systems. To paraphrase Mrs. Bentley; “If we have another war, we’ll have to protect German and Japanese machinists-or fight with hoes and pitchforks.”

Mrs. Bentley is still very active on the Washington scene, lobbying for issues in which she believes.

AEA looks forward to our continuing association with Mrs. Bentley.

Implications of Offshore Outsourcing – Part II

By Dr. Ron Hira, P.E.

Assistant Professor of Public Policy - Rochester Institute of Technology

Part I (published in the last newsletter - June, 2004 Vol. 13, No. 2)

Part II – 3. What Are the Likely Impacts of Offshore Outsourcing and Offshoring?

4. What Types of Jobs and How Many Are Moving Offshore?

Part III (to be published in the next edition)

5. A Potpourri of Proposed Policy Solutions

6. How to Move Forward

Please Note: The views expressed here are entirely those of Dr. Ron Hira and do NOT represent RIT’s or IEEE-USA’s official viewpoints.

This article is a set of rough informal observations on some of the characteristics and potential impacts of offshore outsourcing and offshoring on the U.S. It also proposes some potential policy responses.

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3. What Are the Likely
Impacts of Offshore
Outsourcing and
Offshoring?

3.1 How Will Offshore
Outsourcing Impact the
U.S.

This is *potentially* a major shift in how our economy operates and it will have some impact on economic growth, national security, the distribution of income, and the workforce. These impacts will be both positive and negative.

On the positive side, the hope is that it will help lift U.S. economic growth and development by lowering input costs of services and expand and open new markets abroad. There are also positive geo-political consequences from increased trade and having poor countries begin to develop.

There are number of areas in which there is some uncertainty on the direction of the impact. We don't know how this shift will affect U.S. competitiveness and our national innovation system. America's economic competitiveness and national security is increasingly dependent on the superiority of our technology and technical know-how. There is a widespread belief -- almost a blind faith -- that as communications,

semiconductor manufacturing, electronic devices and other key technological capabilities are off-loaded to other countries, the United States will just move on to the next field, to the next "big thing".

Many observers, including government officials, argue that the next "big thing" is going to be nanotechnology, and that nanotechnology is going to generate enormous economic benefits and create many new jobs. We can only speculate on the impact that nanotechnology will have on the economy and jobs, and hope that it will be significant as some predict. However, we should not be complacent. As a nation, we are not alone in our pursuit of the frontiers of nanotechnology. China is currently the second largest producer of technical papers in nanoscience and nanotechnology, even ahead of Japan. With great cost advantages in addition to this advanced technical knowledge, we should anticipate that China will compete strongly for new nanotechnology jobs and manufacturing opportunities.

U.S. manufacturing has also been hit hard by offshore outsourcing. This has important and serious consequences for U.S. engineers and for technological innovation, economic growth and national security. Some wonder whether manufacturing matters very much since it only accounts for about 15% of the Gross Domestic Product. However, from a technological innovation point of view, manufacturing matters greatly in the gross domestic product. Nearly 48% of American engineers work in the manufacturing sector. The manufacturing sector also accounts for 62% of all research and development (R&D) in the U.S. The prevailing management approach is to locate R&D as close to manufacturing production as possible. As manufacturing moves overseas, it is inevitable that both engineering work and R&D will follow.

At this stage in the process, in spite of the rhetoric by industry, the jobs being created abroad are to a reasonable extent at the expense of workers here. Many American workers are being displaced and are not being redeployed in our current jobless recovery.

The implications, with respect to taxes and the economy, of this are obvious. The chilling effect it is having on technology professionals is immeasurable. Job insecurity is extremely high and many of our nation's best and brightest students are already shying away from studying technology disciplines in college. They don't see a viable and stable career in IT work.

What all of this does not capture is some of the more subtle aspects of the innovation capacity of a country. Does it matter whether these companies keep technology jobs here? I think there is a compelling case to be made about the spillover benefits from these industries and these jobs. Many of the entrepreneurs who start the technology companies of the future will get their own start in today's technology companies. There are countless stories of technologists who learned the ropes from an established technology company only to split off later and begin their own successful firm. Intel got its start out of Fairchild Semiconductor. Ross Perot worked for IBM before starting EDS. The German software maker, SAP, got its start when its founders left IBM in Germany. Thomas Siebel, founder of Siebel systems, worked for Oracle.

There are even less visible impacts on innovation, such as who gets to set technical standards for the next generation of technologies. The setting of technical standards is an increasingly complex process and setting standards is becoming more

3.2 How Will Offshoring Impact Developing Countries

From the perspective of the developing countries that are gaining these jobs, there are many positive impacts. Many of them have identified this as the best path to growth as many of them try to replicate India's success. Their comparative advantage is low labor costs. They are not only gaining technological knowledge, but more importantly, they are learning the business practices of the leading corporations in the world. They are also moving up the ladder of innovation and there are many macroeconomic advantages, particularly with respect to current accounts. Most importantly, these countries have finally found a way to begin to utilize a hitherto idle labor force.

critical for technology businesses. A recent story about how the Chinese government is setting its own software standards for the next generation of wireless computers, mobile phones, and DVD players might be an indication of this.

We've had an active policy for the past 58 years to maintain a strong science and engineering workforce in the U.S. for economic and national security reasons. Again, there are many spillover benefits to having this technical human capital here. As more work moves offshore, the Defense Department will have to beef up its ability to acquire and assimilate foreign technology. There are also potential questions about the critical data being housed offshore for Homeland Security.

As a nation, we've benefited enormously from the so-called brain drain of other countries. The best and brightest from all over the world have been attracted to the opportunities that America affords them. Offshoring seems to have already changed the relative level of attractiveness for the best and brightest. Opportunities in their home countries are already much more attractive than they once were.

There are other issues of international governance. Intellectual property rights enforcement is weak in many of these countries, but companies themselves will need to evaluate whether the reward is worth the risk.

If I were advising these countries, I'd point out some of the potential risks that they might face. As companies figure out how to move these jobs from America to one developing country, it will likely be easier for them to move again. Right now, the Mexican Maquiladoras seem to be losing the battle with Chinese manufacturing, and this may be something that is replicated in services, as more developing countries target these jobs and industries. In fact, in some ways it might even be easier to move services jobs, potentially leading to something akin to a race to the bottom as countries begin to smoke-stack chase.

The bottom line is that offshoring will create positive impacts in both the U.S. and developing countries, but there could be some serious negative impacts in the America. We also don't know the extent of those impacts.

4. What Types of Jobs and How Many Are Moving Offshore?

A spate of recent studies from forecasting firms predicts the number of jobs that will move overseas. I am reluctant to quote any one of them because they are all speculative in nature. However, it is clear from all of these studies that there is a growing consensus that offshore outsourcing of high-skill jobs will not only continue but accelerate and expand to include an ever widening cluster of occupations.

Let me also emphasize that these are not low-level jobs that no Americans would want, but high-skill/high value added positions filled by some of our best and brightest engineers and computer scientists. I have heard enough anecdotal evidence from experienced engineers with advanced degrees facing problems to believe that it is becoming more common. Companies are not only moving production overseas, but engineering design and research and development as well. In some cases, American engineers have even been given the choice of being laid off or moving to another country, but at a much lower level of compensation than they had been earning in the United States.

Having said that, the bottom line is we really don't know which positions and how many will move offshore. There are a few reasons for this uncertainty. First, most of the reports come from 'research' firms that also happen to have consulting practices in helping companies shift work overseas. They may have an interest in overestimating the trends a bit in order to convince clients that this is something the clients' peers are already doing. Second, the companies shifting jobs overseas are doing it in a hush-hush manner. They do not want to call attention to their plans or activities in fear of a public backlash and more importantly a stateside employee backlash. Third, and most importantly, the government has yet to publish any objective statistics, which I assume is because the agencies haven't collected the data.

4.1 Uncertainty Provides Opportunities for Competing Studies

We have heard many people debate whether offshoring or offshore outsourcing is good or bad.

Anyone who tells you it is all bad or all good for the U.S. is being very simplistic in his or her reasoning. We have seen a number of 'studies' that declare that outsourcing is a "Win-Win". One study in particular by McKinsey has been promoted by them as "The *Real* Economics of Outsourcing." There are many weaknesses in this study, but I will only highlight a few:

- Much of the data in the study is gathered from case studies done by McKinsey consultants – the data is not available for others to review
- There are no models provided in the study, so there is no way to even discuss whether the assumptions and models are realistic and/or to complete a sensitivity analysis on the models
- The study *assumes* that workers who are displaced by offshore outsourcing will be "redeployed" soon at substantially the same wages. This seems to be a very strong assumption considering the job creation of the past three years.
- The study's most critical weakness is that it's devoid of any discussion on potential impacts (costs and benefits) on U.S. innovation and security.

Any study that calculates the value of offshoring to the U.S. at the confidence level of a penny on the dollar is extraordinary.

The study authors do not reveal the financial interests that McKinsey Consulting has in the direction of the offshoring market. If the offshoring market increases, McKinsey is sure to benefit. McKinsey has had NASSCOM, the Indian Software Services Industry Association, as a long-standing customer and they have jointly issued a number of reports on the Indian IT industry. Additionally, McKinsey sells offshoring consulting services. This study would be surprising if it did not come to the 'Win-Win' conclusion.

Anyone who has followed the exhaustive discussion for the past twenty years about the Information Technology Productivity Paradox will attest to how difficult it is to calculate returns on

investment at the firm, industry or country levels. In fact, Professor Robert Solow from MIT won his Nobel Prize by showing that more than 50% of economic growth of the U.S. in the first half of the last century could *not* be explained. By chance, he happened to call the residual, *technological change*. Keep in mind it is the *unknown* part of economic growth that happens to be labeled technological change.

The point is that there are many uncertainties in any economic change, and offshoring is no exception. Like most structural changes, there are winners *and* losers in offshoring. Will the world economy overall be a winner? The answer is most likely affirmative.

Will the U.S. be better off? We really don't know. Anyone who provides a definitive answer one way or the other is practicing fortune telling.

If we look within the U.S. economy there is certain to be many people and organizations made worse off because of offshoring. The real question is not whether it is good or bad, but how one compensates those who are going to be adversely affected by it.

It is a moot point to discuss why U.S. corporations have decided to offshore more of their work because they view it as a way to improve their operations. Their pat answer is that it is the great force of "global competition" that is beyond their control. We could debate the credibility of this faceless un-attributable explanation, but at this point, it is rather unimportant. In our current environment, there seems to be little to be gained by hoping to appeal to their role as a U.S. company, and one really can't blame their actions. The corporate managers are doing what they believe is in the best interests of the company.

The third and final part of this article will appear in the next edition of the American Engineer.

Latest Numbers from the Bureau of Labor Statistics

<u>Consumer Price Index:</u>	+0.1%	Aug 2004
<u>Unemployment Rate:</u>	5.4%	Aug 2004
<u>Payroll Employment:</u>	+144,000 (p)	Aug 2004
<u>Average Hourly Earnings:</u>	+\$0.05 (p)	Aug 2004
<u>Producer Price Index:</u>	-0.1% (p)	Aug 2004
<u>Employment Cost Index:</u>	+0.9%	2nd Qtr 2004
<u>Productivity:</u>	+2.5%	2nd Qtr 2004
<u>U.S. Import Price Index:</u>	+1.7%	Aug 2004
Other DOL Statistics:		
<u>Unemployment Initial Claims:</u>	369,000	Sep 25 2004
<u>Federal Minimum Wage:</u>	\$5.15	

The civilian labor force is the sum of employed and unemployed persons. Those not classified as employed or unemployed are not in the labor force. The unemployment rate is the number unemployed as a percent of the labor force.

Exclusive at the AEA website:

<i>Find your local chapter</i>	http://www.aea.org/chapters/
<i>An Open Letter to the Republican Party by AEA President Bill Reed</i>	http://www.aea.org/documents/statements/reed_letter.htm
<i>20 Defenses of Offshoring and Why They Are Wrong</i>	http://www.aea.org/20_refute.htm
<i>Guide To Pending Tech-Visa Legislation</i>	http://www.aea.org/legislation.htm
<i>AEA By-Laws</i>	http://www.aea.org/documents/aea/by-laws.pdf
<i>Why an AEA?</i>	http://www.aea.org/documents/tax/why_an_aea.pdf
<i>RAND Corporation Study Finds No Tech Labor Shortage</i> (link)	http://www.rand.org/publications/RB/RB1505/

There is much, much more, so visit the AEA website and find out for yourself.

Additionally, make the AEA membership grow by passing on the AEA URL (www.aea.org) and this newsletter to all your colleagues and encourage them to join and participate. Send us an E-Mail request (BillR@aea.org) and we will forward a PDF copy for easy attachment.

ATTENTION: MEMBERS & SUPPORTERS:

This is the last newsletter we will provide in printed format. All future newsletters will be in digital format only. You have received this copy because AEA does not have an e-mail address for you. If you wish to receive future “American Engineer” newsletters, we must have a valid e-mail address. We can provide members with an e-mail address in the form: `username@aea.org` at no cost to you.

As of January 31, 2005, we will drop everyone from our rolls that does not have a membership expiration date ending in the year 2005 or later. We do not want to lose you so please update your membership. If you know or think your membership is good until XX2005, please let us know (Give us a month).

You may check your membership expiration date at the upper right hand corner the mailing label on this newsletter. No date in this location either means we lost your records when we had the simultaneous two hard disk crash earlier this year or you have never joined AEA. If your membership number in the upper left hand corner of the mailing label contains x's, (Mxxxxxx-xx) we lost your records but know you have been a member. We desperately need your help; please continue your support.

We have the best opportunity ever to make significant inroads into the immigration and offshoring problems at this time. The H-1b and L-1 temporary work visas are the lifeblood of the offshoring problem. If they can be eliminated or significantly reduced, it will cripple the offshoring trend.

We cannot do it without your support. We need your help!

Bill Reed, AEA President

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The American Engineering Association is a National, non-profit corporation dedicated to the enhancement of the engineering and scientific professions and our nation's continued technical leadership. Our members are from virtually all disciplines of the nation's technical community.

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We welcome your suggestions and comments:

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