

February • 2003

Offshore Software Development: Is It Helping or Hurting Our Economy? By Cindy Easton, owner, Easton Communications



We all know by now that our nation and Oregon are in the midst of the worst economic downturn in two decades. In the past two years, 1.6 million jobs have been lost nationwide. Employers slashed payrolls by an unexpected 101,000 in December. This decline, which followed a drop of 88,000 in November, was the worst since February 2002. The U.S. unemployment rate was 6 percent in December, but this percentage doesn't represent the 191,000 jobless people who stopped looking for work in December and aren't included in the unemployment count. The previous month, 390,000 were excluded from the count.

### **Recession hits Oregon hard**

Oregon has the nation's highest unemployment rate, at 7 percent for December. While this is an improvement over November's 7.1 percent, the number is misleading in that it doesn't include the thousands of people who drop off the list each month. So while the unemployment percentage may imply that things are improving, it doesn't accurately represent the real percentage of unemployed people.

In the early 1980s, Oregon migrated away from an economy based on its natural resources, most predominantly timber. At the same time, Oregon began taking advantage of the technology boom and took steps to encourage companies to grow their technology businesses here. The thinking at the time was that having strength in technology would lead to a more stable economy long term. The boom economy of the late 1990s seemed to be proof that this transition was a good one for Oregon and the Oregonians working in technology-related positions at the end of the twentieth century.

In early 2000, however, the technology landscape began to change as our country entered a recession. As of November, Oregon had 121,642 unemployed people. It's hard to know how many of these people left jobs in the software industry. The categories for which the Employment Department collects statistics don't break out high-tech or software separately. This makes it difficult to know just how bad the problem is in the tech sector in Oregon. Nationwide, estimates are that 32 percent of all job cuts came from the tech sector (which includes telecommunications, computer, electronic, and e-commerce) in 2002, and 36 percent in 2001.

### How does offshore outsourcing add to the trend?

Adding insult to injury—at least from the perspective of unemployed technology workers—companies nationwide are following a growing trend to outsource technology jobs offshore. This trend began in the 1980s and gained momentum in the late 1990s. Some estimate that as much as 40 percent to 50 percent of U.S. IT services work could be done overseas in the next five to 10 years. Just what does this mean to our ability to rebuild Oregon's economy and the possibility of increasing our job numbers to their former levels?

# Who's following the trend?

The migration of technology development to India begin in the 1980s, when General Electric and Citibank took advantage of India's low-cost, well-trained, English-speaking technicians to work on routine software development. In the 1990s, the city of Bangalore, India began transforming itself into the Silicon Valley of the subcontinent, and began developing service centers for handling all types of IT functions, including credit card applications and billing processing. Now Bangalore provides sophisticated R&D and software engineering for many U.S. companies.

Some of the biggest names in the nation and the Pacific Northwest have realized the benefits of outsourcing technology development overseas and have significant investment in technology jobs in India:

- Texas Instruments has a staff in Bangalore designing sophisticated chips and has acquired approximately 200 patents.
- Oracle Corporation has a center in Bangalore that employs 2,400 people to generate student management software products.
- SAP has a 500-engineer facility in Bangalore and is planning on spending an additional \$100 million to boost space and staff.
- Microsoft plans to spend \$400 million on software and business development in India over the next three years. A portion of this investment will be used to promote technology education in India, furthering the possibility of continued software development jobs moving to India.
- Hewlett-Packard, which already has several thousand services people employed in India, is planning on growing its presence in India. Longer term, HP is planning on moving as much of its services business offshore as possible, focusing on China as another major consulting center.
- Intel has a new complex in Bangalore. 950 engineers work at this facility designing new chips.
- Sun Microsystems employs 400 engineers at its facility in downtown Bangalore.

• Cadence Design Systems, Analog Devices, and Cisco are also expanding design centers in India.

Within India, local firms such as the Tata Group (which is traded on the Bombay Stock Exchange), Infosys, and Satyamm are growing their software and consulting arms, and stand to augment the services industry in India. These Indian-based consulting firms are directly competing with U.S. consulting firms for business.

All told, some 25,000 engineers work in Bangalore, India, with more in other locations such as New Delhi. Within three years, this number could swell to as many as 65,000.

The offshore trend isn't limited to India. Other countries are starting to emerge as key areas for technology development:

- Electronic Data Systems currently has 4,500 employees working out of 13 "Best Shore" facilites located in India, Brazil, and New Zealand.
- IBM also has a "Best Shore" strategy, with services centers in India, Mexico, Argentina, Brazil, Venezuela, Canada, and China.

### Why move jobs offshore?

There are many benefits of moving jobs overseas. The cost of a talented programmer in India is around \$20,000 per year, a fraction of the cost of a U.S. tech worker doing equivalent work. Overall cost savings can be 25 to 40 percent.

In countries such as India, workers are proud to take on low-profile tasks such as software maintenance and quality assurance. These tasks are sometimes the type of work that U.S. engineers are less enthusiastic about performing, and are only too happy to see them go elsewhere. However, when Indian companies began to take these "grunt work" tasks on, they focused a great deal on quality and gained the confidence of their U.S. employers. As time goes on, U.S. corporations are becoming more and more comfortable assigning more important responsibilities to Indian software developers.

Technological developments that facilitate communication are accelerating the shift offshore. Low-cost, high-bandwidth telecommunications links, standardized business applications, and Internet-based collaborative tools make it easier to develop software and manage projects with workers in various locations worldwide. It's possible to have software projects and call centers functioning 24/7, with work occurring around the clock. Using video conferencing technology, project meetings occur with representatives from all locations.

### Unexpected advantages to offshore development

Offshore software development can have some other unexpected advantages. Consider the efforts of Daniel Werner, founder of the Corporation for Sustainable Agriculture in Russia (CSAR), a non-profit organization focused on developing a solution to Russia's inability to grow enough food in their depleted soils.

During his many trips to Russia as a food exporter for his business, Hillsdale Corporation, Werner learned that one of the reasons that Russia can't grow enough food is that their soil had been destroyed by the very efforts intended to make it rich. Farmers east of Russia's Ural Mountains were unable to obtain fertilizers as there were no local fertilizer manufacturing facilities. Thinking they were helping their soils, farmers applied whatever nitrogen-containing chemicals they had available, whatever they happened to be. This practice caused the soil to become completely barren, able only to provide the most minimal of crops.

Werner's deep love of Russia and its people led him to begin investigating a solution to their agricultural problem. He worked with U.S. soil scientists to develop potential solutions. To do this, however, required funding. While in Russia, Werner noticed that in addition to a food shortage, there was a lack of employment. Included in the ranks of the unemployed was a large number of highly educated software engineers. In January 2000, Werner put 23 of these engineers to work and formed a company in Russia. The Russian engineers work on software development projects for U.S. companies. The bulk of the profits from his Russian company fund CSAR so that Werner can continue to work on Russia's solution to the soil problem.

Werner's efforts have multiple benefits. He is providing employment in an area with a serious unemployment problem, as well as helping to increase Russia's ability to produce enough agriculture for its people. And he is saving U.S. companies upwards of one-half of what they would typically pay for a software development project.

Werner is very aware that offshore developers are competing for work that could be done by people in the U.S. When asked for his views on this, he expresses general concern about the situation. "I won't take a project if it means an American will lose his job. I don't want business that bad. I feel very strongly about this," says Werner. He chooses to focus on projects that companies would not be able to initiate, much less complete, if they were to use higher-cost U.S. labor.

### The drawbacks

The offshore model does have some drawbacks, some of them more serious than others:

Infrastructure problems. Consider India, the country that first gained a foothold as a major location for offshore development. Many areas in India, including the technology center Bangalore, are short on electricity. Blackouts, similar to the rolling blackouts that occurred in California during the energy crisis of 2000 are a common occurrence, often happening multiple times per day. Most big complexes have their own power generators, increasing costs substantially. The only international airports in India are in New Delhi and Mumbai (formerly Bombay), making it difficult to get to development centers in other cities, such as Bangalore. Travel between cities is difficult, due to a primitive highway system. India has inconsistent policies toward foreign investment. And its tense relations with neighboring Pakistan add a level of uncertainty.

- Security. A less obvious risk, but one that is getting more attention is the increasing risk of theft, sabotage, or cyberterrorism. Outsourcing to countries such as Britain and India is generally considered safe. However, there is increasing concern about the possibility of abuse by hackers, organized crime agents, and cyberterrorists in nations such as Pakistan, the Philippines, and Russia. To date, there has been no serious breach in security of this type occurring. But this may only be because none have been found. Letting outsiders work on the software that runs businesses and financial institutions could be the springboard for a plethora of problems. Additionally, many companies have call centers in these foreign countries call centers that may collect information ranging from credit card numbers to social security numbers.
- **US job losses.** Another drawback that is starting to get more attention is that many of our local programmers, and increasingly, software engineers, have seen their livelihoods shift to less expensive operations overseas. Given the state of our economy and the need to be creating more jobs, and not fewer, this is a serious concern.

# • Cadence example

Cadence Design Systems transitioned software development, quality assurance, and documentation responsibility for several of its Windowsbased electronic design tools to its facility in Noida, India beginning in 2001. Teams at sites in Portland, Oregon, Irvine, California, Chelmsford Massachussets, and Noida, India worked together to transition source code, documentation, and their accompanying responsibilities to India.

Teams worked together remotely to support the India team in coming up to speed with their new responsibilities. Team members were able to do this by first traveling to India, and later by holding phone conference meetings at times that would accommodate the 12½-hour time difference between the West Coast and India. This meant that many times people were taking phone calls from their homes at 9:00 p.m. or later. Team members relied on e-mail for daily communication and used source control software to facilitate the safe transition of files between sites. After close to two years, the transition is complete and the positions of the software developers, quality assurance engineers, and technical writers in Portland and Irvine no longer exist.

### So how bad is it?

In 2000, 27,171 computer jobs moved out of the U.S. to overseas locations. Forrester Research estimates that by 2005, the number will increase to 472,632, and by 2015, a total of 3.3 million U.S. jobs and \$136 billion in wages will transfer offshore to countries such as India, Russia, China, and the Philippines. Forrester estimates that 70 percent of these jobs will move to India, 20 percent to the Philippines, and 10 percent to China.

These numbers reflect estimates for IT and computer jobs. They don't reflect other areas that are also moving offshore, such as call center services and back-office accounting. This change is reminiscent of the wave of American blue-collar jobs that moved to East Asia in the 1980s.

At this time, Indian-based companies are taking only a small portion of the U.S. IT income. One analyst estimates they take in less that \$6 billion per year, or less than 5 percent of US IT spending. But it is clear that the offshore model has taken a foothold and will continue to grow.

# What does this changing strategy mean for technology jobs in Oregon?

Oregon has lost thousands of technology jobs in the past two years. The people who formerly held these positions are competing for a limited number of available positions. Many people have been looking for a job for a year or longer, and consider themselves lucky to receive a response from an inquiry about a position, much less an interview.

The stark reality is that the bulk of these jobs won't be replaced for five years or longer, if at all. Along with the decline in the technology industry comes the trend to move jobs offshore. These moves reflect permanent, growing changes in how technology companies are restructuring themselves in order to regain or maintain profitability in today's economy.

### What can we do about it?

As a state and a nation, we must begin acting strategically if we are going to re-employ the vast numbers of computer and software workers who have lost their jobs in the past two years. Given that more and more technology jobs are moving offshore, the situation is more complex than it seems on the surface. Much thought and planning needs to occur to address this situation. The exact answer doesn't yet exist. There are, however, possible ideas that may help alleviate some of the problem.

### Choose the right projects to outsource.

Some software development just isn't suited for going overseas. Security software, for obvious reasons, must be kept within our national boundaries. Biomedical software, which is an emerging area, may also be more effectively developed domestically. Efforts to position Oregon as a center for the development of security and biomedical technology development will go a long way toward employing our displaced technology workers.

### Consider the impact to support positions.

It is unlikely that the entire software industry will move overseas. The functions that support the software industry will continue to remain here, with job roles that conceive of, design, and market software products. However, whenever software development positions are eliminated or aren't created, the other functions that support those positions generally go away as well. Lacking a department of software developers, fewer human resources, finance, and administrative positions are necessary.

### View from the governor's office

Oregon's new governor, Ted Kulongoski, has said that strengthening Oregon's economy and creating more living-wage jobs is one of his top priorities. When asked for his views on how to replace jobs that have been lost to offshore facilities, Kulongoski states, "It is indisputable that there has been a major shift in the kinds of jobs available in the high-tech sector over the past decade. That is why it is so important that we counter that with a push for a research and development focus within high tech." He believes that the solution, to a large degree, is based on creating more need for R&D. "Oregon is fortunate that within the technology community there is an existing commitment to R&D jobs in Oregon. For example, all of Intel's most sophisticated microprocessor research is done here in Oregon. We must look for ways to emulate the R&D job creation that has already taken place. And in turn we must invest in the knowledge economy and focus on improving our higher education system," says Kulongoski.

### Shift US focus to R&D

It is clear that if we are to recreate jobs that have been lost in the software industry in the past two years, we need to shift our focus. Our companies and teams need to be focused on the creative energy that leads to new products and technologies. Initial design and creation of intellectual property can, and should, still be done here. Specifications for new products can be created here. Project management can still occur here. The economic realities will, however, necessitate that pure coding, software maintenance, and software updates are done offshore.

This means that U.S. software developers need to understand how business and technology work together. Our education systems need to begin making changes to their computer science curricula to ensure that graduates are positioned to be more than implementers. They need to be visionary, have an entrepreneurial spirit, and know how to focus on the "big picture" of the software development process. These are the people who will continue to remain employable in the next decade and beyond.

### Take advantage of the trend

The trend to do software development offshore can ultimately be a boon to our burgeoning technology industry by educating software developers to be engineers and designers instead of coders. Writing software code is very tedious and labor intensive. By farming out the labor-intensive portion, we can focus U.S. skills on the definition and design of new products. This makes the technology industry more productive overall.

Pete Mackie, president of Seaquest Software, a software development and consulting business based in Oregon, sees both sides of the issue. He sees that his business is now competing with offshore developers. But he also sees opportunities. Says Mackie, "Using offshore developers, we can do more and do it better, for less money. An analogy to illustrate this model is to think of what it takes to create a building. Architects and engineers design buildings, but they don't build them. This job is passed on to the contractors who manage the building trade workers who put the buildings together –

piece by piece. These trade workers specialize in specific sets of skills. You don't see a bricklayer doing plumbing or electrical wiring."

The bottom line is that the offshore trend is here to stay. The great minds in our industry – and there are many – need to shift their thinking and strategies so that this trend can help, rather than hinder, technology being an industry that helps our limping economy once again stand tall.

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