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Innovation will lift economy -- be patient

`NEW ECONOMY' MYTHS ASIDE, TECH INDUSTRY HASN'T LOST ITS VITAL ROLE

By Timothy Bresnahan

As the downturn in the U.S. economy drags on, new myths about technology and Silicon Valley are taking hold. For a time, the valley mythology was that it was unstoppable; technology was creating good times that would never end. Now many people outside the valley say the tech boom did nothing for the economy; they tar the boom as nothing more than a gigantic stock-market scam. To add insult to injury, they blame the technology sector for the nation's economic downturn -- which, though painful, is mild compared to the economic implosion here.

Did the excesses of the high-tech boom contribute to our current economic woes? Absolutely. But advances in information technology also made a huge positive contribution. The explosion of Internet usage certainly helped, but the real driver of the economic surge was a revolution that had been building for more than a decade. Over that time, businesses had been using computer networks to steadily improve customer service and productivity.

The good news for the country, and the valley, is that such innovation is continuing in businesses nationwide -- and that is the main reason the economy will rise from its slump and the current high-tech crash will end. Over time, even companies that think they bought too much information technology will find innovative ways to take advantage of the computers and networks they have. Then they'll want more, and Silicon Valley will be in business again -- even if it's not creating overnight millionaires.

It's easy to see how the United States has benefited from having a large and vital high-tech sector. IT-based automation increased annual productivity growth for the whole economy by about half a percentage point. That's an enormous contribution. Productivity growth rates of 3 percent per year are the kind that make economies much richer in a generation, but reaching that rate of growth would have been impossible without the type of revolution that technology created throughout the economy.

IT-based automation also had short-run consequences. It kept the economy growing through the late 1990s, a remarkable accomplishment, since, with the exception of a mild recession, the economy had been growing since the early 1980s. That made the expansion of the economy far longer than most.

Many people bought into the valley mythology of the time, thinking that ``new economy'' companies alone were driving, and could continue to drive, economic growth. But IT is most valuable to the overall economy as an ``enabling'' technology for non-tech businesses. Those companies have to think of applications for the technology before productivity can grow, and that takes time.

Lag time

Take banks, for example. They took advantage of networking technologies to have automated teller machines so you could get your cash at night, then of database technology so you could check your balance over the phone, then of Web technologies so you could manage your account from your PC or apply for a loan from home. Those improvements in banking convenience took many years and didn't result just from banks buying IT. Bankers had to reorganize their operations and reconsider their relationship to their customers to make the changes work well.

Typically those types of basic changes in bureaucracies and customer relations -- for banks and most other businesses -- lag behind major inventions in information technologies. Leading-edge users will find applications soon after advances in IT. But on average, companies take five to 15 years to put major IT advances into practice, and that is what matters for the growth of the whole economy.

Information technology did make a big contribution to economic growth in the late 1990s -- just as the dot-commers thought -- but it wasn't just because of the rise of the Internet.

The country's economic surge was also the result of five to 15 years of business changes that built on a series of important IT inventions. PCs had gotten cheaper and easier to use. Networks of workstations replaced many mainframes in corporate data centers. Databases grew larger and more powerful. The body of enabling technology grew better, and then grew better faster with Internet technologies in widespread use.

But dot-commers, caught up in the Silicon Valley mythology, forgot the crucial role of the rest of the economy. The laws of economics had *not* been repealed to make way for some ``new economy.'' The less-romantic reality was that an expanding economy makes for very good times in the capital-goods business, in this case the business of selling computers, software and data networks.

Silicon Valley grew in the late 1990s because the economy was growing and companies were buying technology. And with the stock market way up, it was easy to found and fund technology ventures, easy to take them public and easy to make them look like successes.

Fear of being `Amazoned'

Believing their own PR also led dot-commers to leap to a radical business model. Rather than selling IT capital goods to existing companies, why not just replace those companies?

It seemed like a technology-company dream. Don't sell IT to people who know how to distribute furniture -- just create Furniture.com. Forget the retailers who for the past 30 years have been sweating out how many Christmas toys to order in June and July -- just create Toysmart.com. While we now know that this was where the ``new economy'' outran its supply lines, in the late 1990s it seemed real to many.

Even traditional buyers of IT bought in to the mythology. Remember that new word ``Amazoned''? It referred to companies that were put out of business because they could not keep up with their new dot-com competition -- such as online mega-merchant Amazon.com. I remember real panic in companies like Merrill Lynch or State Farm. Weren't all their stockbrokers and insurance brokers going to be replaced by Web applications by about now? They, and thousands of other companies, pushed their bureaucracies to change rapidly to avoid being Amazoned.

In the process, they bought a lot of IT capital goods. The whole economy bought a lot of IT capital goods. Selling that hardware, software and networking gear was a great business to be in.

Over time, all of these excesses led many people to the biggest excess of all: They got the idea that there could never be recessions again.

Wrong. The technology- and investment-led expansion came to a halt in 2001. Companies nationwide realized they had been buying IT capital goods too fast. The kinds of productivity gains they had hoped for come only from long, slow changes in how company bureaucracies and markets work. Better technology can speed that up, but not to the pace people expected in the late 1990s.

The prospect of being Amazoned by ``new economy'' radicals receded, and the radicals stopped looking like the wave of the future and started looking like overcaffeinated twentysomethings. Some of the urgency went out of the desire for automation. Companies stopped buying computer hardware and software at their earlier pace, and the economy went into its current investment-led downturn.

A declining or slow-growing economy is a bad time to be in the capital-goods business. A downturn caused by excess investment earlier on is even worse. That is where the information-technology sector sits today. Its customers think they have already bought most of the computers and software and other technology they need, too much in some instances. They can safely slow their technology purchases.

But such gluts of tech-related goods will not continue forever; new technology and new uses for existing technology will see to that. And even as companies slow their tech purchases, they're continuing the process of using IT and the Internet to automate buying and selling. The economy is simply exploiting technology at the pace of bureaucratic change, not on Internet time.

Automating buying and selling is still an area full of attractive applications; companies could, for instance, offer customers access to current information about inventories. Finding new ways to apply technology to buying and selling will take a while, but as the new applications are found, they will not only help many companies and the economy regain vigor, they will also raise the demand for IT. New applications in large bureaucracies always call for more computer and communications capacity, bigger databases and so on.

Information-technology sectors and companies that are ready to support their customers in that growth will benefit from an upturn in demand. Widespread use of broadband or wireless will fuel new applications. And a critical promise of the Internet will finally be fulfilled: Microsoft is expected to finally deliver technologies that will enable companies to write important new buying and selling applications. (If Microsoft had not blocked widespread distribution of Internet access technologies, such applications could be easier to write today.)

Taken together, all the new buying and selling applications will ensure that tech sales, and then employment, will turn back up.

Timing of turnaround

The exact timing of such a turnaround in the tech sector cannot be predicted at this point because it depends on broader forces that have nothing to do with technology or productivity but that affect the national economy. We are facing the possibility of a costly war with Iraq. Tourism and the airlines continue to ail as Americans fear traveling. And the nation could also suffer from Washington's inattention to economic policy. Because the tech sector needs healthy businesses to buy its goods, it is vulnerable to macroeconomic fluctuations in the broader economy.

Still, in the long run, the prospects are very positive for both the national economy and the tech sector. That doesn't mean that there is no real chance of economic contraction now. But it does mean that the growth prospects for a fundamentally sound economy like ours are very good.

Silicon Valley will share in the economy's long-term growth, but it will not see the kind of boom we had in the late 1990s. That is a good thing. The idea that all the benefits of an important new technology have to be realized *right now* is foolish. It took generations of steady improvement in information technology, and in its uses in the rest of the economy, to build toward large contributions of IT capital to productivity growth.

The idea that the founders of new companies should be able to cash out in a couple of years is also foolish. It was a dozen years between the founding of Intel and IBM's choice of the company to provide chips for IBM PCs.

A tech future in which entrepreneurs take time and bear risk to build technologies, companies and markets has nothing wrong with it.

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