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Exploring the promise and pitfalls of the global information economy

More Than Just R&D...

National Innovation Policy: An Urgent U.S. Need

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Over the next few weeks, both major parties and both presidential candidates will be promoting their technology and manufacturing strategies. President Bush has already grown fond of saying that we are in the beginnings of an innovation economy. He is right. We are in an Information-Intangibles-Innovation (I-Cubed) Economy where relentless and continuous improvement is needed to stay competitive. But we don't have a national innovation policy to keep us on top. Yes, we have a science and technology (S&T) policy and are fashioning a manufacturing policy. But those are not the same as an innovation policy.

Don't get me wrong: President Bush and Senator Kerry are pushing needed proposals to increase funding for research and development (R&D) and to improve math and science education. Though still important, they would at best power a giant leap forward into the gadget-based industrial economy of the 20th century. They are not policies for the creativity-based information economy of the 21st.

R&D is only one part of innovation. Some innovation is technology driven; some is not. Doing things differently can be extremely important--consider Wal-Mart's "big-box" marketing and "cross-docking" logistics concepts, Dell's build-to-order process, or Southwest Airlines' strategy for quicker turnaround on the ground.

Many technological innovations require organizational innovations as well. As MIT Professor Eric Brynjolfsson's research points out, much of the productivity gain from new information technology comes from concomitant innovations in organizational structures.

Even new-product development is often more the result of interactions with customers and suppliers than of a breakthrough in the lab. 3M Corporation, a highly sophisticated company technologically, uses a "lead-user" process to identify and then adapt innovations that are already employed in leading-edge and similar markets. New uses for old products, such as teenagers morphing cell phones into music machines, and creative new design, such as a more user-friendly web page or a more functional layout of an airport terminal, are also key features of innovation. As is better tasting coffee.

And employee suggestions add untold product and process innovations to our economy outside the R&D lab. Many companies have instituted "knowledge management" systems to capture and share the innovative knowledge circulating within their workforce.

A 2002 RAND report on innovation, *New Foundations for Growth: The U.S. Innovation System Today and Tomorrow*, summed it up:

...[W]e immediately think of scientists and engineers working sometimes on their own but most often in laboratories or R&D facilities operated by private industry, by universities, and to some extent by the government. Yet, much innovative activity occurs outside the formal precincts of R&D labs. R&D departments tend to be an artifact of large firm organization. But in all company settings much “fixing” that amounts to innovation is done on the line by employees not principally charged with the innovation task. This type of informal activity too is an element of the national innovation system.

Our public policy often ignores these other facets of innovation.

To use a sports analogy, imagine an NFL coach who concentrates solely on the passing game--working only with the quarterback and the wide receivers. Granted, these are the players that produce many of the TV-highlights plays. But as any football fan can tell you, you don't get to the Super Bowl if you neglect the running game, defense, the kicking game, and special teams.

We have equated innovation only with S&T and have neglected other parts of the game. Is S&T necessary? Yes. Is it sufficient? No.

One of the first things we need to do is figure out how well we are doing. We need to measure differently and better. There are a lot of data on such S&T indicators as R&D expenditures, patents, the number of workers with technology degrees, and student math and science test scores. But the U.S. has no organized means of collecting information on innovation broadly. Our S&T indicators need to be expanded to innovation indicators.

The European Union is already doing this; it will release its third Community Innovation Survey next month. That survey will cover topics such as the number of new or improved products introduced, new markets developed, new processes adopted, and overall expenditures on innovation activities--including not only R&D but also worker training and industrial design. The Australian Bureau of Statistics conducted an innovation survey in the mid-1990's and is preparing a new survey for this year that will cover technology innovation, new products, and organizational innovations. The Organization for Economic Cooperation and Development is in process of revising its manual for collecting statistics on innovation.

The U.S. needs to institute its own Innovation Survey. Only when we look at the big picture and find out where we really stand can we begin to put together all the pieces: technology, education, creativity, organizational innovation, workforce training. Otherwise, we will have a lopsided team that isn't going to win the economic Super Bowl.

If you doubt me, just ask Steve Spurrier.