

Is U.S. Losing R&D Edge?

The New Reality in Science and Technology

The United States invests roughly \$145 billion in research and development annually — more than the GDP of roughly three-quarters of the world's nations. However, we have to make this investment count. To maintain our global leadership, we need to focus research on the right things and we have to make tough decisions.

Of course, we are all aware of the pressures that budgets are under; the era of endless government research funds is over. To stay ahead, we have to make things that count, either machines or ideas.

The U.S. was an unstoppable force throughout the past century because of its ability to innovate. At the center of that innovation was a philosophy shared by public and private research labs built on tackling hard problems with creative and determined zeal. It's not that we have lost the ability to innovate, but we don't always make our investments count.

To stay on top, the U.S. must realign its priorities and focus investment in areas that have the chance to create something other societies want. That means continuing to invest in science and technology (S&T), but we have to be smart about the way we do that. In harsh terms, we cannot afford to spend one dollar on things that will not help the U.S. stand apart from the rest of the world.

For years, our government research labs have enjoyed relative autonomy and sufficient programmatic funds. Yet much has been squandered. Investment transition rates in government labs, the rate at which labs transition their ideas into useful capabilities, are typically around 30 percent. In other words, only 3 out of every 10 dollars results in a new capability.

Because of organizational, behavioral, technical and even congressional reasons, it is difficult to shape government research portfolios. In previous years, this situation was inefficient but tolerable. No longer.

S&T is the lifeblood of government innovation; it was the U.S. Defense Department that did the precursor work that led to the development of the Internet and GPS. To the extent we approach S&T seriously, we have a chance to discover many more of these world-changing technologies. "Serious" in this context means having a viable portfolio analysis process that ensures investments are well-placed.

We have been privileged to work with

organizations that have pioneered new approaches to S&T portfolio management. Surprisingly, it is not the process or the cleverness of portfolio mechanics that is the key. Instead, it is the deeply embedded nuances of how the process is implemented that counts.

It may seem strange to think that the real issues in effective portfolio management are political, organizational and cultural, rather than technical. But that is largely true. Moreover, just as nuances are important when it comes to effective portfolio management, the same can be said for effective transition.

Good research programs don't typically die as a result of biting off too much technical risk. They die because people take an insular view of where the program fits within the bigger picture. Program managers need to focus on such nonresearch issues as the political context, price sensitivity of the customer and the concept for how to put a capability into operation.

Labs must be able to convince stakeholders that they know what they are doing. With investment transition rates around 30 percent and budgets under extreme stress, portfolio managers have to change the way they do business.

Leaders of S&T laboratories can undertake five actions to improve the quality of their portfolios:

- Figure it out for yourself. Don't wait for someone else to tell you why you are in business. The private sector focus on competitive advantage is important in the public sector, too. In the new reality, multiple labs will fight over the same pot of money.

- Align your portfolio to both tactical and strategic needs. Determine what is important to you and your staff. What are you trying to achieve beyond the tactical aspects of delivering on promises to customers? Think about sufficiency, technical excellence, professional development and preeminence in key fields — all important strategic imperatives.

- Senior management steers the ship. Portfolio management is not easy. Don't leave it up to a department to handle. If it's easy, that means the tough decisions are not happening. This is one area of management that cannot be abdicated or pushed down.

- Rely on logic and common sense. If you involve the right people and use the right approach, the decisions coming out the back end are unassailable. Some of the best thinking today in portfolio analysis is built on a logic framework that delivers common-sense outcomes.

- Don't ignore the human factors. If you want to actually achieve something, don't opt for an IT systems approach. Portfolio management is the ultimate human process at the core of what makes research organizations relevant. Passion or complex notions of worth and value cannot be automated.

There is a cliché floating around about a "coming storm." In this new era of peer competitors around the world, we need to get our act together. The simple truth is that we have a lot of competing priorities and not enough resources to fund them.

Only one course of action is logical. Invest in areas that will drive the greatest probability of generating competitive advantage. We cannot allow this simple concept to be derailed by organizational, political or cultural factors, nor can we ignore these factors as we strive to transition new capabilities.

We need to encourage the leadership of our nation's critical research assets to be bold and persistent. Some already are. But we need a full quorum.



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