2. Transforming How Government Invests and Innovates in Technology to Drive Results and Speed Change

By Nitin Pradhan

Introduction

As the pace of economic and technological change continues to accelerate, there is no question that government must transform to keep pace. Current governmental structures, however, are still rooted in a world that existed decades ago—a world in which the Internet, mobile computing, and "big data" could not be contemplated, much less leveraged to make the public sector more efficient and effective. A review of several key elements of this infrastructure points to several actions that leaders across the branches of government can take to facilitate and leverage the benefits of smarter innovation and investment. This chapter shows how such actions would help the government move at the speed of change.

Public-Private Innovation Brings Opportunities

The United States technology industry sector continues to grow at about twice the rate of the normal U.S. gross domestic product. It is clear that if the U.S. is to continue to lead the world, then technology will be the driving force behind it. So what role does the government have to play in this new, fast-paced tech economy? The answer is clear: to continue nurturing bold technology initiatives that have the potential to maximize public value and private sector growth.

"Public value" is the delivery of high-quality, results-based services that drive citizen satisfaction and build trust in public organizations and enterprises. "Private growth" is the increased generation of revenue, profits, and intrinsic value of portfolio companies.[1] So is the U.S. federal government well positioned to accomplish this role effectively? Not exactly. Winning through the use of technology will require bold visions, holistic implementation strategies, new and improved governance structures, and innovative, agile, and flexible approaches for the public and private sector to collaborate, innovate, and drive results.

Bold visions are within the reach of the federal government, but holistic implementation strategies, end-to-end governance, and public-private innovation can be improved. The federal support for technology-driven initiatives including how problems are identified, budgets formulated and approved, acquisitions planned and managed, programs and projects executed, and how the subsequent operations and modernization is conducted is fundamentally inefficient, perhaps even flawed. The current "system" encourages fragmented problem definition resulting in point solutions that deliver inadequate value and are later cumbersome to integrate, consolidate, grow or retire, and create new vectors for security risk and ongoing maintenance. This fragmented approach must change.

Further, opportunities for dynamic public-private innovation to drive and accelerate bold technology initiatives are now limited. These governance and collaboration gaps do not allow efficient

---

1.   Launch Dream, LLC, http://www.publicprivateinnovations.com/our-champion/

delivery of public value through private growth at lowest taxpayer cost. Major transformations are required for the U.S. government to keep winning through technology in this hypercompetitive world. This chapter presents three guiding principles and three recommendations for achieving rapid progress.

Innovation Equals Growth

Governments, businesses, and citizens are now all under intense pressure to do significantly more with much less. With good reason, all industrial sectors are now looking to technology for increased efficiency and effectiveness. To better understand the impact of technology on growth, it is instructive to look at the two recent examples of technology that stimulated social and economic development: the Internet and the Human Genome Project.

According to the Boston Consulting Group's recently published report, "The Internet Economy in the G-20," part of its Connected World series,[2] "By 2016, there will be three billion Internet users globally—almost half the world's population. The Internet economy will reach $4.2 trillion in the G-20 economies. If it were a national economy, the Internet economy would rank in the world's top five, behind only the U.S., China, Japan, and India, and ahead of Germany." In the second example, the Battelle Memorial Institute's recent report[3] on genomic revolution estimates that a "$3.8 billion investment in the Human Genome Project from 1988 to 2003 helped drive $796 billion in economic impact and the generation of $244 billion in total personal income."

What do both these examples have in common? These technology initiatives were boldly incubated by the United States federal government and commercialized by the private sector. What is clear is that transformative technology initiatives have a strong positive impact on the United States in jobs, companies, and competitiveness. In both cases, the government had a lead role to play in their success.

Guiding Principles for a Transformative Approach to Technology-Driven Innovation and Growth

Principle One: Infostructure Is Today's Infrastructure

A paradigm shift has happened due to technology. Cloud computing has changed the back-end processing in technology. Wireless has moved communications away from landlines. Mobility, tablets, and smartphones have revolutionized access points. Cheap sensors and GPS have altered our thinking of how, when, and where data can be collected and analyzed. Software is getting more assembled than developed. This is the age of "infostructure." The federal government must now focus on opportunities to build this new and emerging infostructure rather than emphasizing investments on older infrastructure concepts. A balanced approach between infostructure and infrastructure will lead to a rich dividend.

For example, the right way to address congestion in high-traffic areas may not necessarily be to add more lanes, but to nurture carpooling applications and dramatically increase the occupancy of cars traveling in high-traffic zones; or to encourage connected vehicle programs where cars auto-connect to other cars and drive safely at higher speeds in more compact formats—allowing more traffic throughput on the same roads.

---

2. The Connected World; *The Digital Manifesto: How Companies and Countries Can Win in the Digital Economy*, January 2012.

3. Battelle Technology Partnership Practice. "The Economic Impact of Human Genome Project: How a $3.8 billion investment drove $796 billion in economic impact creating 310,000 jobs and launched the genome revolution," May 2011.

The key takeaway about infostructure is that government must encourage public-private innovations as a means to succeed in this hypercompetitive world. The government and the private sector both have very clear and separate roles to play to drive technology innovation. The government must focus on creating the environment for large successful private sector investments in futuristic technology initiatives by focusing on forward-thinking, growth-oriented public policy, legislation, regulations, and standards. This is a critical area where federal government can lead rather than follow, and can make a lasting impact on the future economic status of the United States. The private sector, on the other hand, must focus on continuing to generate entrepreneurship, innovation, and building efficient and effective business operations in emerging technology industries within the United States. As the government starts thinking more "info" rather than "infra" centric, the new paradigm will drive other lasting changes in traditional industries and make the United States a "technomy."

The federal government can reinvent itself as a premier player in the innovation-centric "technomy" of the future by focusing on moving faster and with greater efficiency and effectiveness …

Principle Two: A Mission IT Focus Maximizes Public Value

Technology services offered by any government organization normally can be categorized in three different areas:

*   IT systems that support mission (such as traffic control or food safety)

*   IT systems that support "back office" functions (such as grants and procurement)

*   IT systems that support infrastructure (such as network infrastructure or e-mail)

While all these types of systems are important, it is immediately clear that mission initiatives and related systems have the maximum opportunity to provide public value and private growth. These initiatives and related systems are also the most complex to conceptualize, visualize, fund, develop, launch, and maintain. Additionally, in many instances, clear roles and responsibilities for business owners of mission systems and their governance of technology projects are lacking. The IT infrastructure systems, on the other hand, have clear ownership within the office of chief information officers (CIOs) in the federal government shops, which are comparatively well governed as they are mostly commodities.

What is clear is that if the federal government wants to make bold strides in providing mission value to businesses and citizens, then IT systems that support mission need to form the core of the government's technology portfolio. Clearly prioritizing mission technology initiatives across the government for funding, and governance for maximum results, are key.

It will also be important to discuss the appropriate role for the private sector in collaborating with the public sector to drive increased mission value for stakeholders. For example, the government can identify unfunded mission focus areas where mission services can be delivered via private sector funding models that deliver mass benefits to citizens. Identifying and holding their executive business owners and contractors responsible for expected results is another key.

This can be done by requiring the measurement of continuous progress in relation to invest-ments being made in the systems. Currently, the federal government's end-to-end large project management methodology for technology-based mission initiatives (starting with conceptualiza-tion and ending with retirement of the systems) needs major overhaul, without which large technology initiatives may have limited scope of driving public value in time and on budget.

Principle Three: Optimization is Required by Functional Segment

According to the government research firm Deltek, the federal government today spends over $120 billion on information technology projects of all kinds. There is every reason to believe that there is significant duplication in the new systems being developed or old systems being modernized. Take the example of IT systems that support a safety mission. Safety is a core mission of many government agencies including the Department of Transportation (transporta-tion safety), Environmental Protection Agency (environmental safety), Food and Drug Administration (food and drug safety) and so on. Each of these agencies have related safety technology systems to carry out their safety mandate. Structurally, safety systems have similar components. Yet each of these systems is conceptualized, architected, designed, developed, managed, and modernized in isolation from one another.

There is every reason to believe that by creating a government-wide "safety platform" with specialized safety modules and data exchange connectors with state and local governments, as well as private sector, the United States government could drive increased public value, better dissemination of knowledge and faster cycle times for citizen service delivery. The key takeaway from this principle is that the federal government must categorize, govern, and fund its existing mission technology systems portfolio by segment architecture. For example, all safety systems within the federal government could be categorized under safety segment architecture and be governed by an adequately funded safety program office within the Office of Management and Budget (OMB), with improved oversight from congressional technology committees discussed below. By creating such a coordinated governance structure, the oppor-tunity to learn from each other's best practices will flourish. Resources will be pooled and duplication will be reduced. Additionally, as requirements across the government are consoli-dated, there will be opportunities to create privately funded technology products with shared development costs, rather than with costly custom solutions as is currently prevalent.

Recommendations for Enhancing Government Efficiency and Productivity to Support U.S. Competitiveness

Recommendation One: Reduce Fragmentation in Governance Structures

The congressional governance of federal government investments in the technology portfolio is fragmented, and therefore not conducive to seeing the benefits of integrated approaches to technology. The Congress has 21 Senate committees and 22 House committees, and many more subcommittees, which directly or indirectly have oversight over technology initiatives and investments in federal agencies. However, technology today is highly connected infrastructure, and a holistic view and investment strategy is a key to future success. It is therefore essential that Congress establish a technology committee or subcommittee (or at least some sort of coordinating body like a task force) focused on maximizing transformative use of technology and effective involvement of private industry for the benefit of the country. By centralizing the technology governance functions in such a technology committee, the government is likely to get a clearer, holistic picture of the needs, challenges, opportunities, and threats for this fast-growing sector and can craft policies and regulations and promote appropriate public-private investments that can drive increased growth.

There is also substantial need for the Office of Management and Budget (OMB) to focus IT oversight by mission segments (e.g., safety), and foster program offices for major government-wide IT initiatives (e.g., data center consolidation). OMB's IT oversight group has limited funding and staff to take on this role alone. OMB can build on the success of its "PortfolioStat" efforts to review agency investments, and use this technique to review technology portfolios that affect mission segments as well. Considering the size of the U.S. government's technology portfolio and its increasingly important role in the U.S. economy, the importance of OMB's IT oversight cannot be overlooked and therefore adequate support is necessary. This investment will easily be recouped in savings from delivering mission initiatives with higher business value on budget and on time.

Finally, there is an urgent need to standardize the structure, capabilities, and capacity of agency chief information officers. Currently, the CIO structure varies widely from department to department, with some CIOs being either political or career, the office of CIO being either centralized (large staff and budget) or federated (small staff and budget), and reporting either to the secretary or another executive. The critical relationship of the CIO with the business owners of mission systems, and the CIO's involvement in mission systems planning and investment, are all too often poorly defined. With such non-standard structures, governmental IT legislation, regulations, policies, and initiatives cannot be consistently implemented across various agencies, creating gaps in mission delivery. Progressive, value-focused inspector general (IG) offices with a modern approach to IT oversight can be very helpful in achieving a vibrant, results-focused government IT portfolio.

The key takeaway here is that unless the executive and the legislative branch take a holistic view of technology investments, results will not be optimized.

Recommendation Two: Develop Measurement Systems to Implement Transformation

What does not get measured will not be achieved. Therefore, continuous, accurate measurement of major technology initiatives is crucial. There are good strides being taken in this regard with the advent of TechStats, CyberStats and PortfolioStats in government. However, multi-perspective measurement, such as the balanced scorecard approach, is key. Rather than individually measuring projects from within a particular agency, technology projects should be evaluated around common segments across federal agencies. For example, it is more worthwhile to have the safety segment portfolio aggregated across the federal government and then compare and contrast these projects to know the best practices and opportunities for integration and consolidation. A segment portfolio optimization program should be initiated, with results from such transparency made available to the public.

There is a further need to have cross-agency priority goals sponsored by OMB (e.g., a safety priority goal) which would have significant mission- (e.g., safety) related focus to improve mission systems. This would also support increased possibilities to work with the private sector, as well as state and local governments, on safety in a consolidated manner, rather than discrete agencies targeting independent opportunities. Furthermore, if there is a congressional coordinating entity for technology, they are more likely to have a consolidated view of what is working and what is not working, as well as potential opportunities to fund or not to fund technology initiatives within segments, making the entire ecosystem more efficient and effective.

Finally, there is an urgent need to create an Amazon.com-like government catalogue of all government technology services for businesses, citizens, or for interagency use. Such a catalogue should list all federal technology services by agency, by segment, and alphabetically; and be searchable. Each service should also have the names and contacts of the business owners for

the system, and other top executives as well as prime contractors should be listed online. Users of individual services should be able to rate and provide publicly viewable feedback on the services online. Low-rated or unused services should be retired or improved. Highly rated or most-used services should be grown by providing additional investments.

Recommendation Three: Recognize that Failure Leads to Success

Sir James Dyson, the legendary British entrepreneur, has famously said that it took him exactly 5,126 failed attempts to make his first bagless vacuum cleaner—some catastrophic disappointments, some minor defects over 15 years before the 5,127th prototype was a success—making him the fourth richest person in the UK with a net worth of $4.2 billion.[4] Recently, there have been several major failures with government investments in the energy sector, including Solyndra and A123 Systems. Tesla Motors, another company receiving government funding, is still struggling to make profits.

While large direct funding of private companies by government is being debated fiercely in political circles, what is clear is government funding of innovation in technology needs to be accelerated. As long as government focuses on funding innovation, it will in the long term drive public value and create private growth industries. Even if there are failures along the way they may in fact be early stepping stones to success and potential future dominance in these upcoming industries for the United States. In most situations, you learn more from your failures than from quick successes.

While particular technologies, products, or companies may fail, the insight, learning, knowledge, experience, and expertise gained from failure are absolutely critical in achieving long-term success. The government therefore must continue to make bold investments to advance transformative technology concepts to ensure leadership of the United States for years to come. It is not that the government must seek failure, but rather adapt from its failures to become more efficient and effective. Sometimes even the vibrant United States private sector, with its multitude of angels, venture capitalists, and private equity firms, cannot take the financial risk and drive the transformative change required for such ideas to take hold. It needs the federal government.

Conclusion

Driving public value through private growth is key for the United States to win though technology in this era of scarcity, and the federal government has a critical role to play. In this hyper-competitive world, change is the only constant, innovation ensures survival and collaboration creates opportunities, but ultimately only transformation leads to success. The federal government can reinvent itself as a premier player in the innovation-centric "technomy" of the future by focusing on moving faster and with greater efficiency and effectiveness through the three principles and three recommendations presented in this chapter.

Nitin Pradhan *is the Chief Executive Officer and President of Launch Dream LLC and the founder and champion of "Public Private Innovations," the nation's first federal technology accelerator. Mr. Pradhan formerly served as the Chief Information Officer (CIO) for the U.S. Department of Transportation (DOT).*

---

4.   "Failure Can Be an Option; Success is Overrated." *The Guardian,* Sunday 22 July 2012.