

# A Roadmap for IT Modernization in Government

*By Dr. Gregory S. Dawson*

IT modernization in government has substantial and increasing momentum. Recent U.S. federal legislation and focus at the highest levels of government has fueled activity across agencies that spend on average 75–80 percent of their IT budget on operations and maintenance (O&M). This activity can significantly improve a public-sector environment where new systems development lags behind the private sector, the federal government has excessive costs and significant vulnerability to cyberattacks, and agencies are often behind the private sector in their ability to implement advanced technologies that could dramatically reshape government operations.

IT modernization—which we define as continuously retaining, extending, and modernizing legacy data and technology assets in order to increase value and achieve organizational objectives—is a key component of enhanced productivity. In addition to saving money, modernizing government systems could significantly address the ever-increasing cybersecurity threats and pave the way to implementing high-potential technologies—like analytics, mobile, and artificial intelligence—in the public sector.

This report examines the status of IT modernization in the public sector and draws on key lessons from private industry, state government, and exemplary federal government agencies.

## **Effective Practices in IT Modernization**

IT modernization is not a new concept in the private sector. As a result of having up-to-date IT, industry can manage technology costs while still taking advantage of new technologies and better protecting itself from cybercrime. Historically, many private-sector organizations have taken an incremental approach to IT modernization, in which they first address immediate points of pain and then, as budgets and time permit, address subsequent issues that arise. This incremental strategy produces short-term improvements and minimizes risk.

After many years of incremental change, many leading private-sector organizations have instead provided a “shock” to the enterprise and adopted an end-to-end, holistic IT modernization strategy. While unquestionably riskier than an incremental modernization strategy, this broader path also can significantly reduce duplicative work efforts resulting from redundant systems and ensure that the organization has sufficient IT capacity for the long term rather than just for the next several years.

This model of incremental improvement followed by end-to-end modernization is not foreign to the public sector. For example, the state of Oklahoma’s modernization outcomes are impressive. State IT spend dropped significantly and the state reduced its annual IT spend by \$112 million. Additionally, the state achieved \$260 million in cost avoidance from IT projects and better contracting. By taking an incremental approach, and then supplementing it with periodic end-to-end modernization, Oklahoma lowered its IT spend while also dramatically reducing its vulnerability to cybersecurity threats.

The federal government has largely relied on the incremental approach, due to two major reasons. First, budget constraints have always been—and are expected to remain—a significant limitation to engaging in end-to-end modernization. Second, agencies have generally had an easier job putting out RFPs for new systems as compared to replacing old ones. Other reasons for incremental change in government include significant complications with legacy systems and technologies, perceptions of risk and magnitude of risk, complexity of integration across agencies, duplication in programs and systems, and lack of key drivers needed to force efficiencies.

These factors have contributed to a number of problems with public-sector IT, including disconnected systems, non-interoperable hardware, reliance on aging infrastructure and out-of-date business systems and solutions—precisely the

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problems that much of private industry faced and solved 20 years ago.

Recent legislative action has helped government refocus on the importance of federal agency modernization, most notably the Federal IT Acquisition Reform Act (FITARA) and the more recent Modernizing Government Technology (MGT) Act. Over time, other federal government initiatives have been suggested to help address modernization, including innovation investment funds, establishment of a digital infrastructure council, set-asides for infrastructure upgrades, and a dedicated capital fund for federal agencies to upgrade their IT systems (now part of the MGT Act). While being in different stages of deployment, all of these initiatives may be helpful for modernization efforts.

### Impediments to Modernization in the Federal Government

Impediments to federal IT modernization largely break down into three areas: spending and acquisition, culture, and speed of technology change.

- **Spending and acquisition.** While the government spends nearly \$100 billion on IT systems annually, strategic spending is difficult. Public funds are often tied to particular purposes, making it harder to invest in IT and then directly allocate the spending, savings, and benefit of the investment to the mission—as the private sector does. Another issue with public-sector return on investment (ROI) calculations is that an investment cannot always be adequately valued for outyears as a company can do via a commercial ROI model—using a full cost model where benefits are measured and recognized over a time, and an understanding of the full costs can be identified and applied.
- **Culture and measurement.** Cultural impediments to changing the status quo also significantly limit modernization. For example, when undertaking innovation within the federal government, numerous federal technologists lament the lack of buy-in from key players in the organization. This lack of buy-in hinders changing

from an incremental modernization approach to a more end-to-end enterprise approach. Similarly, few government organizations have the process discipline to undertake major changes in organizational policies and procedures, and this further stymies innovation. Perhaps more importantly, most federal agencies fail to systematically implement and track key IT performance metrics.

- **Pace of technology change.** Without a doubt, the speed of technology change contributes to much of the need for modernization. For government today, leveraging this pace of technological change requires time and freedom to experiment with these technologies and see how best to employ them. Positive technological changes create a demand for modernization—a demand that the federal government has been slow to respond to and realize outcomes from.

### Impacts from Avoiding Modernization

Failing to modernize can lead to a host of negative impacts. Unless the problem is addressed, these outcomes are likely to increase in severity.

- **Increasing costs.** Many agencies continue to rely on aging and obsolete infrastructure, systems, and business applications. Along with significant duplication and redundant solutions, agencies face further budgetary and resource constraints due to excessive operations and maintenance (O&M) and technology costs.
- **Security and privacy concerns.** Cybercrime is one of the most worrying trends in technology, both for the amount of damage that can be done per incident and the number of incidents. Thus, it is not surprising that government cybersecurity strategies depend upon modernizing legacy information systems.
- **Lack of access to advanced technologies.** Industry has leveraged advanced technologies quite effectively. However, modern hardware and software is required to effectively take advantage of these technologies and access the data to achieve such results. Effectively implementing

technical innovations such as analytics and AI at scale are simply still out of reach across much of the government.

### Keys to Successful Modernizations

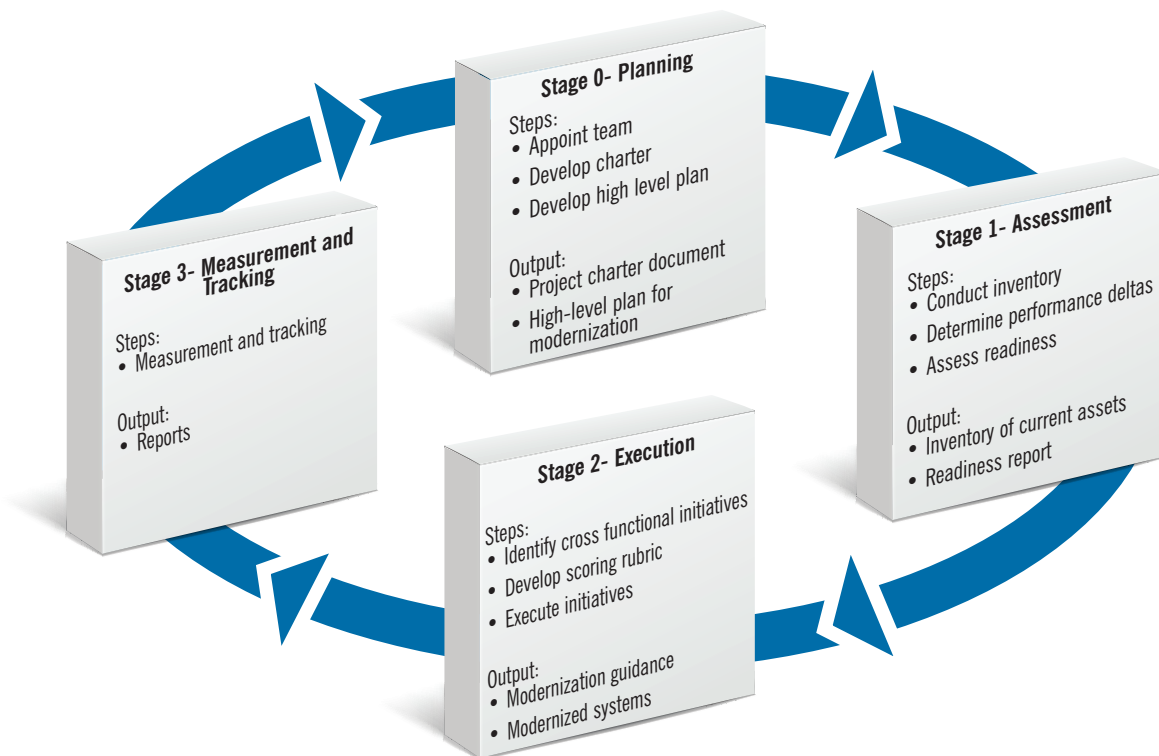
Several key lessons emerge from this report’s analysis of successful modernization initiatives:

- Understand the organizational drivers for modernization
- Plan at the enterprise level
- Deliver incremental value at the departmental level
- Communicate value to citizens and shareholders
- Understand what you have and where you need to go
- People first then processes, and only then technology
- Importance of leadership
- Look at the “long tail” for modernization

### Recommended Roadmap for IT Modernization

Based on these key lessons, the roadmap below illustrates how successful IT modernization could take place in government, and is consistent with the newly released guidance of the MGT Act. Major points from the roadmap include:

- Modernization must be an on-going process rather than a single standalone event, to allow for continuous modernization rather than costlier sporadic “catch ups.”
- Feedback occurs throughout the process to capture lessons learned and act accordingly.
- Ensures a focus on how technology is supporting mission goals.
- Key and supporting players should be identified for each step, making leadership and operational staff both aware of their requirements and empowering them to act.
- Check-ins with agency leadership, functional leadership, technical leadership, and key users must take place throughout the process.
- Ensures the optimal blend of a strong execution strategy, technical approach and the right team.
- 360-degree communications will ensure knowledge and buy-in.
- Measurement identification, and tracking and communication of those measures, should take place both inside and outside the organization.



## Conclusion

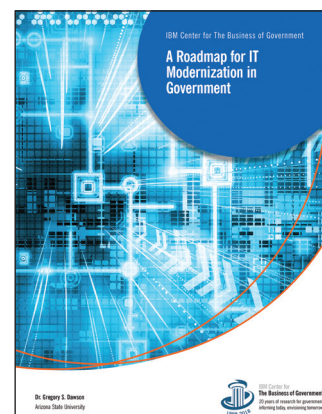
The high allocation of public-sector O&M costs, in relation to the commercial sector, is not sustainable and only treats short-term symptoms instead of modernizing IT to correct systemic problems. Federal agencies must consider their spending on IT and how to make the right investments that can increase efficiency and decrease costs. IT modernization initiatives can transform an organization's infrastructure, technologies, applications, and services to greatly reduce costs, improve performance, and meet evolving mission needs and priorities.

The government should make key investments in IT modernization and identify and prioritize the necessary initiatives for maximum effectiveness. Priority investments should be integrated into the budget planning cycle, and appropriate measures must be taken to provide a foundation for continuous innovation and improvement. With recent statutory and agency progress, the federal government is well-positioned to set an example in implementing modernization frameworks, like those outlined in this report, and moving forward with effective IT modernizations that improve mission performance.

### TO LEARN MORE

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The report can be obtained:

- In .pdf (Acrobat) format at the Center website, **businessofgovernment.org**
- By e-mailing the Center at **businessofgovernment@us.ibm.com**
- By calling the Center at **(202) 551-9342**