Seven imperatives for success in IT megaprojects

To implement public-sector IT megaprojects successfully, leaders must pay close attention to process, people, and governance. We discuss seven imperatives that, although not technically difficult, require dramatic changes in mind-sets and ways of working.

Kreg Nichols, Shantnu Sharma, and Richard Spires

Rapid advancements in information technology have benefited governments around the world, enabling them to provide new services and become more efficient. But as IT programs become larger and more complex, they also bring considerable and rising risk. In a recent study, McKinsey and Oxford University showed that one in six IT change initiatives overruns its budget by 200 percent and takes about 70 percent longer to implement than originally planned.[1]

While many IT program failures in the private sector remain largely hidden from view, public-sector failures can receive national or worldwide attention. In an effort to understand what causes such failures and what brings success, we interviewed more than 50 IT and procurement leaders in both the public and private sector and analyzed a variety of IT programs across the performance spectrum. We summarize our findings in this article.

Why programs fail

Government IT programs run into trouble for some of the same reasons that private-sector IT programs do. Other challenges—a complex budget process, for instance—are unique to the public sector. We found that the primary contributors to failure in large IT government programs are the following:

[1] Alexander Budzier and Bent Flyvbjerg, "Why your IT project may be riskier than you think," *Harvard Business Review*, September 2011.

Multiyear time frames. Government agencies typically execute large-scale IT programs in multiyear cycles—an approach that artificially increases the complexity of programs and leads to higher failure rates. Sometimes cycles are unnecessarily long because the team seeks to build everything—including infrastructure—from scratch instead of reusing existing infrastructure. The problem can worsen when teams try to prevent failure by assiduously following a traditional approach, even in the face of continued missed deadlines and customer disappointments. To complicate matters, the pace of technological change continues to accelerate. Ever-shorter product life cycles combine with higher-than-needed program complexity to further increase program risk and the probability of failure. Once these multiyear IT programs are finally in place, they end up delivering functionality on outdated technology that often does not meet true business needs.

A very broad requirements scope. Best-practice IT program management calls for limiting the requirements-gathering cycle to a defined, upfront phase during which program leaders prioritize high-level requirements and decide what the program can deliver based on timelines, resources, and business needs. In the public sector, however, the IT funding process calls for very specific requirements up front instead of later in the program life cycle. Furthermore, program leaders often accommodate the requests of the greatest number of stakeholders. The many additional requirements and interfaces increase complexity exponentially, resulting in significant delays and cost overruns. Due to weak governance, new requirements are added even during program execution—increasing complexity and causing further delay.

Complex budgeting and funding processes. Large-scale public IT programs suffer from protracted funding cycles, budget uncertainties, and other challenges not often found in the private sector. With regard to funding approval, IT leaders must often articulate program budget requests and technology needs years in advance—an upfront time lag that contributes to technology obsolescence. Also, teams often compensate for inefficiencies in the budget process by front-loading their budget requests. When a program manager is projecting budgets five to seven years out, the budget requests are almost always inaccurate. Once the program has the money, other issues arise. Funds are typically appropriated only for a given fiscal year. Teams have limited ability to move portions of current-year funding to the next year or to reallocate money among programs in the same portfolio—even when changes in the technology landscape or in business needs require a reallocation.

Limited IT acquisition skills. Nearly all IT programs require procurement of hardware, software, services, or a combination of these. Agencies therefore need a firm understanding of acquisition best practices, federal acquisition rules, and IT. Federal contracting officers are invariably experts in the first two but often lack IT expertise, thus creating a communications mismatch—there is no easy way to translate a program's technical requirements into the procurement team's non-IT language. This mismatch extends the program timeline and, at worst, results in suboptimal acquisition, as the procurement team is typically not engaged early enough to be able to use creative contract vehicles (such as prototypes or requests for information) to help meet program needs. It also creates an opportunity for vendors to exploit

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the contracting team's lack of IT expertise to their advantage. In cases in which acquisition personnel do have IT expertise, they are not required to dedicate their time exclusively to IT acquisition. The resulting multitasking on IT and non-IT acquisition can delay program timelines.

Lack of expertise in program management. Successful execution of large-scale IT programs is contingent upon the assignment of an experienced and qualified program manager. However, there is a shortage of qualified program-management personnel in government. Often, an individual is asked to take on the role of program manager based on capabilities shown in another role, such as mission operations. While such capabilities are valuable, those individuals lack the critical cross-domain expertise—a broad understanding of IT, procurement, and the mission or business function—to deliver a complex IT program. Furthermore, since there is no formal federal career path for IT program managers, time spent in program management may not result in career advancement, giving talented individuals little incentive to pursue program-management roles. Exacerbating the situation is the rapidly evolving IT landscape; each arm of the federal government tries to identify technology trends and emerging best practices on its own. As a result, there is significant variance across the government and among program managers as to what constitutes a best practice and at what pace it should be implemented. Vendors sometimes use this disconnect to their advantage in contracting.

Weak governance. Every government IT program has a broad set of stakeholders, including agency leaders, business-process owners, and the IT, acquisition, finance, security, and legal functions. Many large IT programs run into difficulty because stakeholders are not fully aligned on the desired outcomes or the approaches to meet those outcomes. Furthermore, there is typically no well-defined set of accountabilities and decision rights, and no disciplined approach for gathering and considering stakeholder input and thinking through the implications. Program managers sometimes receive conflicting direction from multiple oversight organizations; stakeholders sometimes make decisions outside the program that nonetheless can have a material impact on the program's execution.

Best practices

We found broad consensus among IT leaders on best practices for large-scale IT programs. Leaders readily admit that many of the practices are not technically difficult to implement but require dramatic changes in employees' mindsets and ways of working. Each of the following imperatives addresses one or more of the pitfalls discussed above. These imperatives fall into three broad categories: the first two are process oriented, the next two focus on people, and the final three deal with governance.

Leverage incremental or agile development

To show business value—and in light of ever-shortening technology life cycles—IT programs must deliver functionality within months instead of with a "big bang" at the end of a multiyear development cycle. Best-practice organizations schedule releases in shorter but well-defined time frames—at least every 6 to 12 months. Each release meets a set of high-level requirements that are later refined based on constant feedback from end users and other stakeholders. There is a hard time limit (say, 3 months) for the creation of detailed specifications, after which new requirements are pushed out into future releases. The staff moves seamlessly from one release to the next: the requirements team, for instance, starts gathering requirements for the upcoming release while the developers work on the current release. A significant benefit of this approach is that the requirements team can obtain detailed feedback from people who are using the system in a production environment. Such feedback can aid both in improving the usability of the system's existing functionality and in providing requirements and design guidelines for the creation of new functionality. This type of approach is what allowed the US Department of Health and Human Services to launch HealthCare.gov, a widely praised consumer-facing Web site, in 90 days.

Incremental development reduces the overall workload but increases the required effort for certain functions and changes the type of work for others. Program managers, for example, must manage multiple pieces and the dependencies among them. Procurement staff must provide flexible contract vehicles that allow for changes as the requirements for new releases are defined. They must let no more than a few months pass between receiving funding and awarding contracts. And these contracts must specify well-thought-out business objectives, a vision of the future-state IT architecture, guiding principles for agile design and development, and a sourcing plan for the initial phase.

Granted, there may be programs for which architectural limitations and legacy considerations rule out incremental development as an option—but parts of the approach (for example, locking down a release and setting hard deadlines for accepting new requirements) could still be useful for injecting discipline into the process.

Separate application development from infrastructure

Another best practice for large-scale IT programs is to separate application development from the underlying IT infrastructure. To simplify operations, achieve efficiencies, and promote the reuse of existing services, leading IT organizations are driving infrastructure standardization, mandating that new IT programs build mission or business functionality on well-defined and separately provided infrastructure where possible.

The implications for schedule and costs are considerable. It is an opportunity not only to make the most of investments by using IT infrastructure across all applications but also to improve end-to-end project timing, since applications can be hosted on the existing infrastructure footprint instead of on a new infrastructure that would have to be built from scratch. Another advantage is better capacity management, since infrastructure is built for aggregate demand levels.

Build program-management capabilities

Managing IT releases every 6 to 12 months requires a cadre of strong program managers supported by competent project managers. To attract and retain the best program managers, government agencies must develop a career track for these professionals and allow them to move easily within the agency and across government institutions. Agencies should, for instance, take full advantage of the Intergovernmental Personnel Act Mobility Program, which allows federal government employees to rotate through state and local governments, colleges and universities, federally funded research centers, and other eligible organizations.

Some agencies already recognize the importance of program-management talent. The Department of Veterans Affairs (VA) and the Department of Defense (DOD) both offer robust training in project- and program-management disciplines, along with on-the-job rotational assignments and mentorship programs for less experienced program managers.

Best-practice organizations support program managers with state-of-the-art tools and knowledge-management systems. Some agencies have created online portals, specifically for program managers, that serve as knowledge repositories (for best practices, process descriptions, templates, and tools) and personnel directories (for example, to help program managers identify and contact others with relevant experience). Both the Internal Revenue Service and the Department of Homeland Security have established formal centers of excellence to harvest best practices and offer expertise in areas as diverse as systems engineering, requirements management, IT security, and accessibility.

Have specialists do all IT procurement

Best-practice organizations hire and train IT acquisition specialists. In the government, this may require the creation of a distinct occupational series specific to IT acquisition, as well as pay and career-advancement paths competitive with those in the private sector. Another best practice is providing cross-functional training and on-the-job experience for IT acquisition specialists—for example, by embedding them in program teams, thus helping them gain the knowledge necessary to better translate business and technical requirements into effective procurement.

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Of course, not all agencies have the scale to warrant a separate IT procurement group. Smaller agencies—as well as larger agencies seeking an alternative to in-house IT procurement—can still have access to specialists through shared-service organizations. For example, both the Bureau of the Public Debt and the VA have specialized groups that charge fees for IT acquisition services.

Some agencies have had success in attracting and retaining talent by casting a wider net, building up IT procurement staff in geographic areas with considerable talent pools but less competition among employers. Instead of hiring in the Washington, DC, area, for instance, some agencies have hired in New Jersey, Texas, Florida, or college towns in other states.

Best-practice organizations also strengthen the IT acquisition capabilities of non-acquisition staff. Some use classroom training, encouraging managers—whether they work in IT acquisition or in other areas—to take IT courses such as those offered at the General Services Administration's Federal Acquisition Institute or the DOD's Acquisition University.

Establish an integrated program team

To help align stakeholders and ensure success from the start of a large IT program, leading companies establish multidisciplinary integrated program teams (IPTs) consisting of business-process owners, IT managers, technical personnel, acquisition personnel, and finance personnel, as well as representatives from the HR and legal functions as needed. Key members of the IPT—including, importantly, the program manager—are dedicated to the program and collocated during its most critical stages, and they remain in place throughout the design, development, and implementation phases of a program's life cycle.

IPTs are highly beneficial to government agencies as well. Senior agency executives should approve the composition of the IPT and reinforce its accountability. For critical or very large programs, it may make sense to get the deputy secretary or the senior-most governance body of the department to approve the IPT's composition.

IPT members should be held accountable for meeting the goals of their functional units as well as of the overall program. Contract officers, for example, may tend to focus on preventing protests and lawsuits, which could lead them to make overly conservative decisions that slow down a program's progress. IPTs should therefore develop performance metrics—for the program as well as for individuals—that strike the right balance of speed, effectiveness, and compliance.

Exhibit

Program- and portfolio-level governance roles should be clearly delineated.

Responsibilities of the governance boards

Function	Program level These governance boards provide guidance, decision making, and oversight of one or more programs	Portfolio and enterprise level These governance boards manage investment decisions, strategy, and operations of a collection of related programs
Define strategy	• Align under portfolio guidance • Approve key program-planning documents	• Determine needs, priorities, strategies, and initiatives
Evaluate investments	• Monitor program costs/benefits • Ensure the program has the right leadership and expertise • Tailor life-cycle governance	• Authorize and oversee portfolio • Designate program governance and stakeholder participation
Make decisions	• Make decisions on milestone transitions and significant changes to scope	• Make critical program decisions that escalate from program governance
Monitor performance	• Monitor overall program health • Escalate issues outside cost/schedule variance thresholds	• Set portfolio metrics and targets • Monitor and report continuously • Integrate with planning and budgeting processes
Manage risks	• Monitor program risks and support risk mitigation • Escalate issues above risk tolerance	• Establish risk-management framework and criteria

Clarify decision rights and accountability for investments

To better align a program's stakeholders, agencies should establish distinct program-level and portfolio-level governance (exhibit). The program-level governance board should comprise executives from stakeholder organizations—including the business owner, IT, procurement, and finance—thus promoting a partnership model and ensuring that no single organization dominates.

Teams should apply best practices of program-manager engagement to ensure effective execution of programs and projects. There should be a single reporting chain, with clear escalation mechanisms, from the program manager to the program-level governance board and then to the portfolio-level governance board. The program manager should also have frequent meetings with agency executives—such as the chief information officer (CIO) or the business owner—to report progress, raise red flags, and engage in collaborative problem solving. Leaders should keep in mind that such meetings will be effective only if the agency establishes cultural norms that encourage transparency. For example, if the program manager delivers bad news, agency leaders should avoid shooting the messenger.

The program manager should be held accountable for establishing the overall program objective and aligning the goals of each stakeholder group. To ensure business, IT, and all other stakeholders share responsibility, the program governance board should sign off on each initiative and milestone review. In most IT programs, achieving alignment should not be a one-time event that occurs at the beginning of a program; rather, it should be an ongoing process throughout the program's life cycle.

Increase external outreach to ensure up-to-date organizational knowledge

To navigate the ever-changing IT market, a government needs mechanisms for collecting and disseminating technology knowledge and trends, and for allowing personnel to engage with colleagues and draw on external expertise from the private sector and academia. Currently, the Federal CIO Council is establishing a best-practices collaboration portal, both to serve as a repository of best-practice examples and artifacts and to bring IT practitioners together to exchange ideas and lessons learned, as well as to provide help to programs independent of agency boundaries. Examples of potential approaches to engage external expertise include fellowship opportunities for private-sector experts, regular "office hours" led by CIOs from the private sector, coaching programs that link private-sector CIOs to government executives, and regular "industry days" on timely IT topics.

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Each of the best practices we have described is useful on its own, and each requires a significant investment of time, effort, and management capital. Organizations should pilot these practices within a few business units and then create an enterprise-wide rollout plan. Many agencies, however, become complacent after they have implemented only a subset of the imperatives or partially implemented all of them. Such agencies do not achieve all of the impact these practices can offer and fail to maximize the return on their investment dollars. Only by acting on all seven imperatives can agencies assure success in managing large-scale IT programs.

Kreg Nichols is a principal in McKinsey's Atlanta office, and **Shantnu Sharma** is a consultant in the Boston office. **Richard Spires** is CIO of the US Department of Homeland Security and vice chairman of the Federal CIO Council.