Next-gen IT modernization—post-pandemic best practices

Platforms, agile development and clear mission priorities are key

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A major hurdle for IT modernization has been how to spark change in risk-averse organizations, including one of biggest constraints—architecture.

"In modernization, there's a huge gap between what we're doing in effective software delivery and agile DevOps, and areas like business stakeholders, end-users, and budget. They're almost talking in a different language, they're using different tools, and in federal government, those areas can be even more siloed," said John Osborne, Chief Architect, Red Hat Public Sector.

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"Considering the number of approvals required, and other factors—rules, firewalls, and sprawl," Osborne said deterrents can make it seems as though nobody wants to change anything. For agency CIOs, wrangling the technology is often the easy part of adopting next-gen solutions. "The hard part is people, process, procurement, politics … and there are a lot of challenges," said Ann Dunkin, CIO, U.S. Department of Energy.

"It comes down to changing culture, to change the way we work," Dunkin said, pointing to

agency actions during the health pandemic as evidence of the speed at which government can change when certain roadblocks are removed. "We took a lot of procurement constraints and political constraints, off the table, and … amazing things happened. … We absolutely created the expectation that government can be fast, can be responsive to the public, and can be available online," Dunkin said.

While the new expectations have persisted, many of the constraints are back in place. Adding to the complexity is the need to scale across organizations, product lines, and services. Agencies need to build on the tools and capabilities, what was learned about using platforms, continuous ATOs, and DevSecOps, for example.

The goal, Osborne said, is, "to deliver capabilities faster to meet the needs of users—and without building future legacy systems, but systems that can easily be updated and modified."

While the IT mandate is increasing—the recent Cyber Executive Order is one illustration—agency leaders, or whomever holds the purse-strings, can find it more attractive to put money into efforts that seem directly attached to mission.

An effective modernization strategy should empower agencies to identify those efforts that will provide a solid return on investment in terms of mission and value to taxpayers. That is easier said than done, though, when an agency's subcomponents have diverse mission sets, priorities, and pressures.

There are steps that CIOs can take to support the enterprise in keeping modernization on track, and from both a mission perspective and for IT and cyber needs. These include promoting collaboration agency-wide; the capture, identification, and wise use of funds; and making sure that the value of IT work is well known.

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"Project execution … has to be a major focus point," in these efforts, said Rick Kryger, Deputy CIO for Operations, U.S. Department of Labor. When costs are higher than planned, "it pushes everything downstream," in the modernization journey, he explained.

"Modernization is going on in the business side as well as the modernization we're trying to drive on the technology side, and the hard part is getting them to align and everybody moving in same direction," Kryger said.

It can take constant effort on the part of CIOs to build understanding and motivate a team to work differently than they have in the past.

Jason Gray, CIO, U.S. Department of Education, described the value of ensuring that stakeholders across the enterprise are on board. "During the pandemic, we had an IT modernization plan that we'd already been marching toward. It's not just by chance that things are getting done: it's according to plan, they're funded, and have buy-in from critical stakeholders," Gray said.

Having customer experience and acquisitions and budget teams in the mix contributed greatly to the ability of the department to pivot to a 100 percent virtual workforce literally with a day's notice, Gray said.

"The problem around having a fixed mindset is that cloud environments are dynamic, and the services that we're building on are changing," said Osborne. A fixed mindset that tries to bake in all risk up front to just check compliance boxes, then deploying into a dynamic changing environment is counterproductive, said Osborne.

One of the benefits of moving toward platforms: "An enterprise can park applications there and modernize incrementally over time and in a low-risk way. A lot of modernization efforts fail [because] the second you start writing code, it becomes very risky. To modernize legacy applications, you need a place to start incrementaling them," said Osborne.

Kryger noted that with the pandemic, federal and state government services that needed to scale were not always able to do that. "There's a balance that has to be struck," he said. "We put a lot of focus on citizen-facing services and how they are executed efficiently and in a timely and fraud-resilient way, especially for unemployment insurance," he said of one of the hot-button issues that was exacerbated by the pandemic.

The Labor Department had been setting the foundations on which to build business and equipment used to interact with the system, Kryger said. "Now, there is a focus on the business systems themselves. They've been aging and need replacement or enhancement to support modern business needs," he said.

One of the largest stumbling blocks to modernization is when an application is going obsolete and forces a solution—which can result in the agency facing a big bill from the vendor, Osborne said. While having a technology or tool run its course is a perfectly valid reason to modernize, there are benefits to having a strategy in place. "Get more ahead of things, and with some methodology for that," he advised, noting that Red Hat has open-sourced its methodology to help score some of the applications.

"The reality is you have no idea what modernizing these old apps is going to cost," said Osborne. "We hear a lot of assumptions about modernizing and where the bottlenecks are, but in a lot of cases those assumptions are wrong," he said.

He described a use case in which an agency was moving an application to a cloud service and was very concerned because the system of record was on a mainframe database. "They probably spent a year planning around that bottleneck [they assumed] it was going to create. It ended up not being an issue at all," he said.

"The most expensive thing in IT in general is building the wrong thing. It doesn't matter what technology you use or what process you use: if you build the wrong thing, that is expensive not just in terms of money, but in time," Osborne said.

To optimize return on investment, start with the right applications—and look first at what applications should be headed toward retirement, he advised.

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"There are a lot of places in government where operations and maintenance eats up so much of the budget," he said. "The cost of keeping the lights on for some of these applications that may be 35 years old … is astronomically high. If you want to do things like AI and machine learning, you have to free up the resources for that."

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