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## **The Drive to Modernize: Governments Hatch Strategies to Bring Legacy Applications Up to Date.**

**Some public entities have been working for years to get their applications in line with business needs. Others are just getting started.**

Legacy software can be a drag: It weighs the operation down. Take, for example, the U.S. General Services Administration (GSA). In recent years, that agency has lead the way in areas like open data, green energy and new models for acquisition, said Sonny Hashmi, the GSA's acting CIO. "Yet, in many cases, our applications are not there to support us in the need to change a process or change data that we need to collect."

After years of building special-purpose applications in silos, governments may find themselves managing portfolios crammed with redundant systems that can't share data or integrate business functions, said Bill Kehoe, CIO of King County, Wash.

Because they're difficult or even impossible to modify, old applications force governments to stick with outmoded procedures, and legacy applications also take a heavy financial toll. "The support cost to maintain all these applications is eating up probably 43 to 54 percent of our total IT operations budget," he said.

The burden of legacy applications constitutes a looming crisis for governments, Kehoe added. "If governments aren't already dealing with this in terms of an overall modernization strategy, they will have to very soon."

Some public entities have been working for years to get their applications in line with business needs. Others are just getting started.

### ***LINCOLN-LANCASTER COUNTY, NEB.: FROM SHELLS TO SQL***

The IT department that serves Lincoln and Lancaster County, Neb., has been modernizing since the 1990s. Early efforts focused on writing new, browser-based front ends for mainframe applications. "We wrote shell programs to replace all the CICS [customer information control system] programs, so we could start presenting things in common ways," said Terry Lowe, systems coordinator of information services for the combined city-county government.

Using this strategy, developers gave all of the government's applications a similar look and feel, provided a mouse-driven interface and added software widgets. "It was a much more pleasant experience for my staff, and they adapted to it immediately," said Lowe.

The team moved on to writing shells for other mainframe programs and, later, to writing code in SQL within the Microsoft .NET framework. Today, about one-third of the staff supports mainframe applications, a third works on products developed by vendors and a third supports newly written programs developed in .NET, Lowe said.

However, things are about to change again for Lincoln and Lancaster County, as it prepares to shut

down its mainframe, moving many apps to a state-run data center. Some apps will stay local, though; Lowe and his team plan to rewrite them in SQL.

Systems developed in SQL under .NET run better than their predecessors on the mainframe, Lowe said. "They're not as expensive to support, because on the mainframe there are some fixed costs that you don't deal with when you've got SQL."

Governments preparing for modernization should first take stock of all the technology assets that might influence the path they choose, said Lowe. Those assets include the skill sets possessed by staff, existing network technology, the email infrastructure and how GIS and document management systems will fit into the picture.

It's also important to explain to elected officials who control the budget why modernization is worth the investment, Lowe said. In the long run, the potential to reduce operational and support costs should win them over. So will the fact that new applications are easier to use, he said. "It's not a real hard sell when you ask people, 'Do you really like these green screens?'"

### ***FORT WORTH: BRING IN THE ERP***

Fort Worth, Texas, has been working on modernization since 2009. It's been moving applications from an old mainframe to a Windows environment and replacing a variety of programs with a PeopleSoft (now Oracle) enterprise resource planning (ERP) suite.

"The goal was to retire the mainframe, ideally before it was too far out of date, and replace it with servers," said Pete Anderson, the city's CIO.

Three years ago, Fort Worth moved its human resources and payroll functions to the server-based Oracle system. In 2014 and 2015, it will move finance, purchasing and budgeting to Oracle as well, Anderson said.

The initial migration still left about 200 applications to modernize, most of them designed for specific departments. In 2012, as a temporary measure, Fort Worth used software from U.K.-based Micro Focus to adapt about 14 of those programs for Windows.

"It's like wrapping the mainframe applications in an envelope that's Micro Focus. That envelope then allows them to communicate and operate on a Windows server," Anderson said. "That was easier and less expensive than rewriting them."

Since then, Anderson's team has been working to determine which of the 200 applications the city needs to modernize, and which it can drop because the ERP system will handle those functions instead. That process has reduced the number of legacy mainframe systems to about 65, he said. The team also hopes that the ERP suite can take over many functions currently managed in Access databases and Excel spreadsheets, he added.

Modernization poses a significant change management challenge, Anderson said. When end users have been working with an application for years, they may be reluctant to give it up. And the proposed changes don't concern software alone: Modernization provides a chance to update existing business processes. "We don't need to automate exactly what they've been doing," he said. "We might be able to use automation to do something even better."

No one will be forced to give up existing software, Anderson said. But he hopes the business units will seize this chance to define their needs and discover how best to meet them. He also hopes they'll choose solutions that exist within the ERP system or else select off-the-shelf solutions. "If this

really is a permanent need, we should look at what third-party products are out there, so we don't have to maintain the solution with our limited staff."

### ***U.S. GSA: OPEN SOURCE OR COMMERCIAL***

The GSA's modernization efforts date back about three years. The agency aims to invest in platforms that are open, configurable and extensible, Hashmi said. Some will be open source solutions, and some will be based on industry-leading commercial platforms such as Salesforce and Appian.

"Instead of building our own version of the wheel, let's buy something off the shelf that addresses 80 percent of our needs and then only invest in the 20 percent that's specific to our business," he said.

Like Fort Worth, the GSA is studying its portfolio to see which legacy applications it needs to update and which it doesn't need at all. One such effort focused on about 1,500 small to medium-sized apps, mostly back-office business process automation tools, all based on 15-year-old technology.

Staff started asking which of those applications people actually used, which were redundant and could be combined, and which supported functions that the agency no longer needed. "Through that process, we shrank that portfolio down to about 100," Hashmi said.

The agency then used a cloud-based platform to create new versions of those 100 applications, which vastly simplified development work on each app. "You're using common business process templates, common workflow templates, common data entry forms and authentication," Hashmi said. "All those things are done once and well, rather than doing them for each application." This approach has reduced the total life cycle cost per application by more than 90 percent, he said.

Large, complex applications, like those used for financial accounting and payroll, aren't easy to modernize, Hashmi said. Rather than rewrite or replace them independently, the GSA might contract with other federal agencies that already have the necessary software and could provide it as a service.

For more specialized applications, a management challenge arises when the agency tries to replace a collection of redundant systems with a single solution for everyone. One example is the work the GSA has been doing to roll out a new real estate management solution. The administration is divided into 11 geographical regions, and each one used to have its own procedures for managing property. When the GSA started working on new software, developers assumed that the product would have to cater to the unique needs of each region — that is until the development team asked regional managers to agree on a single set of policies and procedures.

"That really paid dividends," Hashmi said. "We were able to build that app in a matter of months in an agile way, with a cost-effective, cloud-based solution."

### ***WASHINGTON STATE: THREE TIERS***

The impulse behind the Washington state government's modernization program came from the Legislature. Lawmakers directed the Office of the CIO to take inventory of the government's legacy applications and then determine how to modernize that portfolio.

CIO Michael Cockrill and his team have identified three tiers of legacy applications. Tier 3 consists of tens of thousands of small apps, most designed to perform a single function in a department, such as producing a quarterly report. The state doesn't have the resources to include those in its modernization effort, Cockrill said.

Tier 2 apps generally focus on crucial functions within individual agencies. Washington has about

3,000 of those, and they need frequent tweaking to keep them in step with changing laws or market demands.

Making those modifications isn't easy. For instance, the mainframe application that comes into play when customers renew vehicle registrations online needs an upgrade. But it's impossible to change that core system without also considering 30 to 40 ancillary applications, Cockrill said. "You have to figure out how to modernize all the supporting functions."

Tier 1 consists of about 200 large, complex applications used statewide. One of the largest is the system used by the Department of Health and Human Services to pay its providers. Many Tier 1 apps run on mainframes, but mainframe technology in itself wouldn't render a given system obsolete.

"We have lots of mainframe applications that we have no intention of replacing," Cockrill said. "They're very economical, they solve the problem and there are people who know the code and can update them." But other apps in the portfolio have fallen behind the business problems they need to address — because they're complex and few staffers know how to work with the code behind them, they'll become candidates for modernization.

Once the state has a list, the IT team will decide case by case how to modify or replace each application. "Anytime users are looking at a significant upgrade, we'll encourage them first to see if there's a commercial product that lives in the cloud," Cockrill said. If not, the team will seek a commercial off-the-shelf product, opting for in-house development only when absolutely necessary.

### ***KING COUNTY, WASH.: HOLISTIC APPROACH***

Officials in King County also plan to start their modernization efforts by taking stock, seeking chances to weed out apps that no one uses or to consolidate those that perform the same functions. Like Hashmi and Cockrill, Kehoe will look to the marketplace for modernization solutions, moving functions when possible to commercial off-the-shelf solutions or to platforms like Microsoft SharePoint or Microsoft's cloud-based customer relationship management service.

One problem that Kehoe's department faces is the plethora of applications that departments develop internally — using Access, for example — and then rely on the IT department to maintain. Modernization will reduce that burden. "Our hope is that a certain portion of our overall portfolio can drop off and they can use other applications," he said. Or they might find that once they streamline the business process, an application is no longer needed.

Like Anderson, Kehoe foresees a significant change management challenge and not only with regard to end users. Many employees in the IT department would like to keep maintaining and updating legacy applications, rather than learn to work on new platforms. "Not everyone is going to be happy," he said. "We have to provide training. We have to show a path forward and make sure they're involved in the process as much as possible."

Because it won't be possible to put all of the county's applications in the cloud or on new platforms, some staff members will continue to work on homegrown systems. "For staff who want to stay in that environment, there will be opportunities to do that," Kehoe said. "For staff who want to expand their horizons and move on to some of these newer platforms, we'll have opportunities for those as well."

King County's modernization effort is part of a larger technology strategy that involves more integration of data, more shared services and creating a simpler applications portfolio, Kehoe said.

That strategy requires a holistic approach to modernization. “If we just took it one application at a time, we would end up with a more modern siloed application portfolio,” he said. “We’re trying to get away from that.”

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Merrill Douglas | Contributing Writer

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