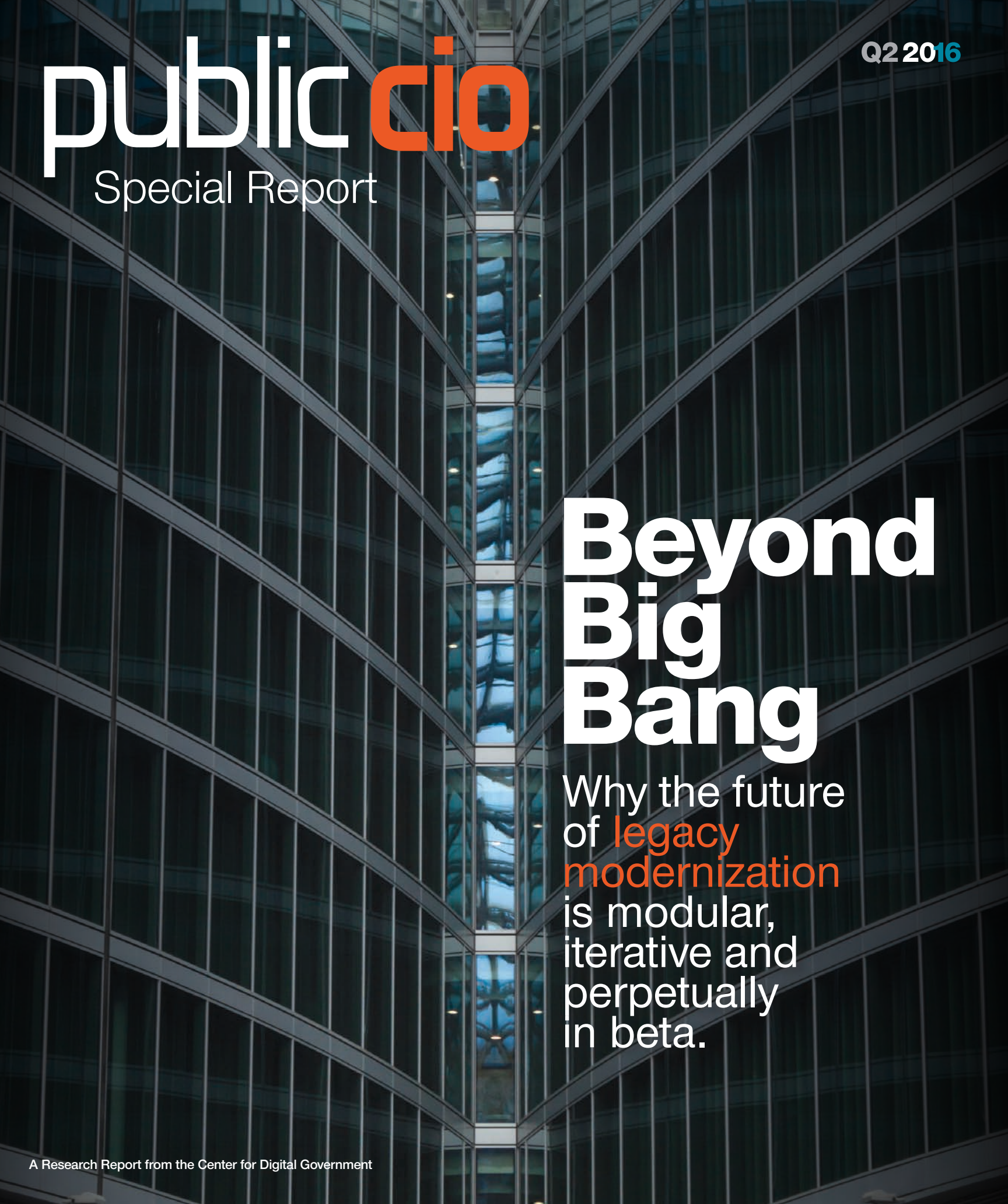

public cio

Special Report

Q2 2016

Beyond Big Bang

Why the future of legacy modernization is modular, iterative and perpetually in beta.

A Research Report from the Center for Digital Government

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Introduction

Breaking with the Past

California has more than 9 million children and more than 22 percent of them live in poverty, according to the Child Welfare League of America. Looking after the welfare of the state's youngest residents is a gargantuan task. To manage the country's largest child welfare system, the state's Department of Social Services (DSS) employs nearly 20,000 social workers and staff, and uses a mainframe system built in the 1990s that relies on technology from the 1980s.

Last year, DSS began work on an RFP to modernize the system. But rather than use the traditional "big bang" methodologies that have pervaded enterprise IT system development, DSS opted to procure and build the system in separate pieces or modules. It was a bold move for a large system that could end up costing tens of millions of dollars. But the change in development will generate value more quickly.

The department had forecast that under a single systems integrator using waterfall development methodologies, it would have taken two years to go to contract and another three-and-a-half years to reach implementation. "We were looking about five to six years out from providing new functionality to our child welfare professionals," says John Boule, director of California's Office of Systems Integration. "We have to do better."

By developing the new system iteratively, Boule predicts that working software will be ready by next year.

Modernizing enterprise IT systems is full of legendary tales of frustration. States have poured huge sums into systems that take as long — if not longer — than what Boule originally projected for the state's child welfare system, only to have a solution that fails to work as intended. Worse, the technology is out of date by the time it finally rolls out.

More than 20 years ago, the Standish Group, an IT research advisory firm, issued its "Chaos Report," which estimated that 31 percent of all IT development projects are canceled before completion. Of the finished projects, nearly 53 percent end up costing 189 percent of their original estimates. Much of the blame, according to Standish, was due to big bang, waterfall methodologies. Today, the risk of incompletion, outright failure and massive budget overruns still resonates throughout IT projects in the public sector.

But the need for modernization couldn't be stronger. Half of all state and local IT budgets go toward maintaining creaky systems, estimates the Center for Digital Government (CDG). Meanwhile, customers are irritated when they have to use these systems, and the employees who know how to run them are retiring in record numbers.

Given the need to modernize and the frustrations with how new development takes place, states and localities are looking at new options. This research report will examine how government agencies can modernize enterprise systems more quickly and will provide some examples of how it's being done. Most importantly, it will discuss best practices that show how iterative, agile IT development can take root and flourish in the public sector.

DAVID KIDD

The Modernization

Government enterprise IT systems, like so many other public sector assets, are built to last. And just like fire trucks, police cruisers, buses or subways, computer systems tend to be special and expensive. In the 1990s, state governments went through a wave of IT modernization, building large-scale, enterprise systems to manage finances, social services and a host of other key government operations. Following the millennium, another round of modernization took hold as e-government initiatives pushed IT into new endeavors, such as web portals and customer relationship management (CRM)/311. Today, many of these enterprise systems are inefficient, expensive to maintain and not customer friendly.

While governments have sporadically updated and modernized some of these systems, overall development has been conservative and traditional, involving big bang, waterfall practices that have proven slow and sometimes risky. As California discovered when it decided to modernize its child welfare system, it can take years to put new technology in the hands of workers.

With technology changing at an exponential rate, waiting three to five years for a new system ends up costing government in terms of innovation. It also impacts how government handles new regulatory requirements and changing business needs.

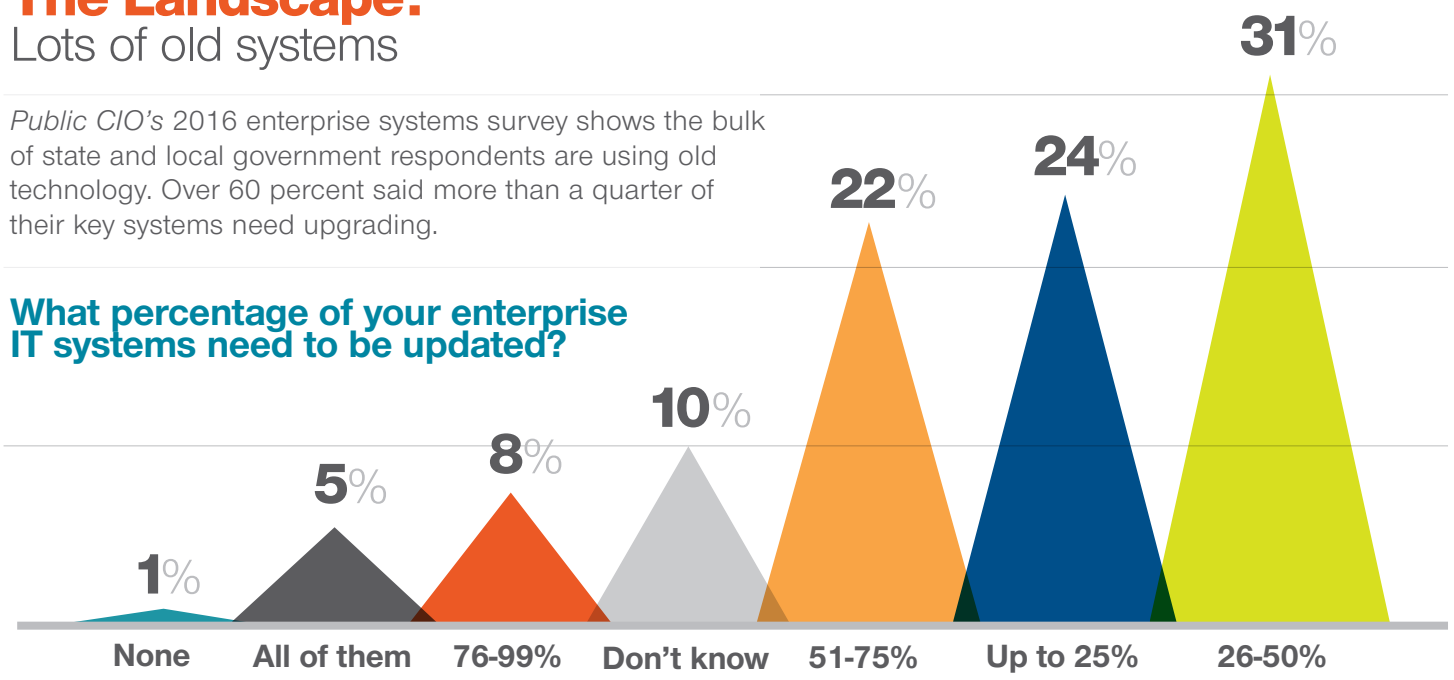
There are other reasons why government can't wait so long to modernize its IT systems. According to CDG, state and local agencies spend $37.5 billion annually to support outdated systems, a sum that represents half of their total IT budgets. More worrisome, the workers needed to maintain those aging systems are heading for the door as they retire at unprecedented rates. New York CIO Maggie Miller told state lawmakers earlier this year she expects to lose 25 percent of her staff to retirement in the next few years.

The public sector's slow pace of modernization has sparked growing frustration, particularly as technology itself evolves at an ever more rapid rate. "In government, we are really faced with a history of projects that take a long time and when they are done aren't close enough to our requirements," Palo Alto, Calif., CIO Jonathan Reichental told *Governing* in 2013. "We need to look at ways to move from idea to execution much faster."

The Landscape:
Lots of old systems

Public CIO's 2016 enterprise systems survey shows the bulk of state and local government respondents are using old technology. Over 60 percent said more than a quarter of their key systems need upgrading.

What percentage of your enterprise IT systems need to be updated?



Imperative

The Challenge:

New systems are expensive — so are old ones

CDG regularly interviews state agencies to understand the cost of deploying and maintaining enterprise systems. The following data, collected in 2015 and 2016, gives insight into the price tag for recent modernization projects, along with the cost of keeping current systems running.

State enterprise resource planning (ERP) systems:

$70m
Median cost for deploying a new system

$7m
Median annual cost for operating and maintaining an existing system

State integrated tax systems:

$34m
Median cost for deploying a new system

$2.3m
Median annual cost for operating and maintaining an existing system

State integrated eligibility systems (IES):

$107m
Median cost for deploying a new system

$8.6m
Median annual cost for operating and maintaining an existing system

Medicaid management information systems (MMIS):

$50m
Median cost for deploying a new system

$19m
Median annual cost for operating and maintaining an existing system

The Impact:

Inflexible and disconnected technology

Modernizing enterprise systems certainly comes with a price tag. But there also are costs associated with failing to upgrade — and they go beyond just dollars and cents.

Which of the following legacy system issues are a serious concern to your agency?

Inability to integrate with other technologies **56%**

High maintenance costs **38%**

Problems meeting reporting/data sharing requirements **36%**

Hard to recruit qualified personnel to maintain legacy systems **32%**

Difficulty in responding to evolving employee/constituent needs **31%**

Poor user/customer experience **30%**

Limited ability to automate regulatory and business rules **26%**

Frequent outages **11%**

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It's Time to Re

DAVID KIDD

think Your Approach

Both the public and private sectors recognize the risks with large-scale, big bang IT development projects. To counter this problem, IT organizations have begun breaking larger projects into smaller, more modular development initiatives. In essence, software development is a continuous process, with developers and end users seeing results at shorter iterations. This gives everyone a chance to evaluate the results and make modifications, if necessary, before the entire project has gone too far down the tracks.

In 2010, the federal government began advising its agencies to break down IT projects into more manageable chunks and to deliver functionality on a quarterly basis. The Office of Management and Budget (OMB), which oversees agency spending, specifically cited agile software development as a means in which agencies could produce software in increments. In a report to Congress in 2012, the Government Accountability Office (GAO) provided this definition of agile:

"More a philosophy than a methodology, Agile emphasizes this early and continuous software delivery, as well as using collaborative teams, and measuring progress with working software. The Agile approach was first articulated in a 2001 document called the Agile Manifesto, which is still used today. The manifesto has four values: (1) individuals and interactions over processes and tools, (2) working software over comprehensive documentation, (3) customer collaboration over contract negotiation, and (4) responding to change over following a plan."

Agile differs in several ways from traditional waterfall software development, which produces a full software product at the end of a sequence of phases, according to the GAO. For example, the two approaches differ in the timing and scope of software development and delivery, the timing and scope of project planning, project status evaluation and collaboration.

When it comes to timing and scope, agile projects produce software in iterations of one to eight weeks in duration, with each segment providing some functionality. These iterations are small in scope and typically produce a single function. For each iteration, a team identifies requirements, and then designs, develops and tests the software. Iterations are combined into releases. In contrast, waterfall development proceeds sequentially with no consistent or fixed duration to produce a complete system, according to the GAO. That kind of development process can take several years, with each waterfall phase addressing a single step in the development cycle. Only at the final phase is the software tested and reviewed for compliance.

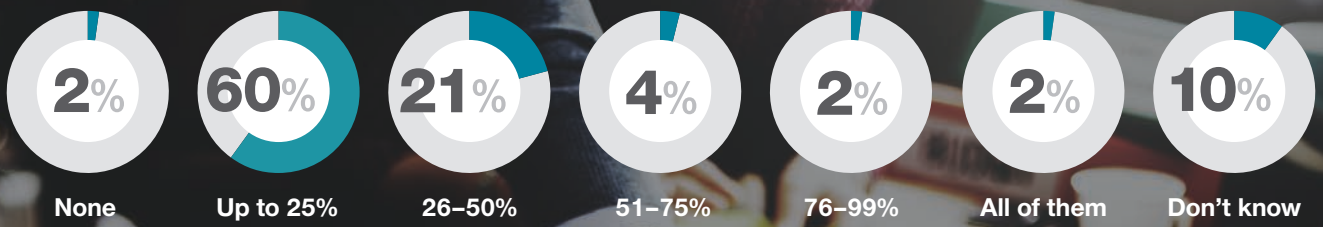
In Maine, agile iterations of software development are done in three-week sprints, according to Josh Karstens, director of the Project Management Office in the state's Department of Information Technology. The business end user is shown a demonstration of what has been built. "So, that way, if they see something that needs to be changed, the agile process allows us to do that," he says.

Collaboration is another key element in agile development. In order for iterations to advance through design and testing at frequent intervals, end-user departments work closely with technical staff. Design teams set tasks and due dates, and coordinate with the end-user stakeholders to complete the tasks and deliver an iteration for demonstration and testing. "When it comes to agile, you not only have to understand the problem you are solving, but also the customer," says Karstens. "Within agile, it's really a collaborative project with the customer."

Under Construction: Modernization is happening

The recession may have put the brakes on system modernization, but activity is picking up now. Sixty percent of survey respondents say they'll modernize up to a quarter of their systems within 18 months. More than 20 percent expect to modernize between a quarter and a half of their enterprise systems during that timeframe.

What percentage of your enterprise IT systems will be modernized over the next 12 to 18 months?



Agile vs. Waterfall

Agile	Waterfall
Work is broken into small-scale segments, which are completed in 1 to 8 weeks.	Development is sequential with no fixed duration to produce a complete system.
Each segment provides a working piece of software.	Working software isn't available until the end of the project.
Testing and user acceptance happens as segments are completed.	Testing and user acceptance happens at the end of the project.
End user involvement is constant and intense.	End users are engaged mostly during planning and testing phases.

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States Get Agile

More state agencies are using agile methodologies for enterprise system deployment. *Public CIO* talked to state CIOs about how they're using agile during the 2016 NASCIO Midyear Conference. Here's what they said.

Stu Davis
Ohio

I think the best part about agile development is the engagement of the business from the get-go. They're right in the middle of it the whole way through. They see the results. We can reset if it's not what they wanted. We're not 18 months out going, "Oh, this isn't going to work." Which is kind of what we would do in the old days.

Rich Kliethermes
Missouri

Like a lot of states, we're transitioning from waterfall to what we humorously call "wagile" — so it's a combination of waterfall and agile. Agile is both a methodology and a mindset — and that has to be understood by our business partners who are working with us on these projects.

James Collins
Delaware

When people start talking to me about projects that are going to take four years, I just doze off. We work in technology and everything is moving exponentially faster. So we're certainly doing hybrid agile, we're doing pure agile — it depends on the project. But I'm saying, can we deploy something in 12 months?

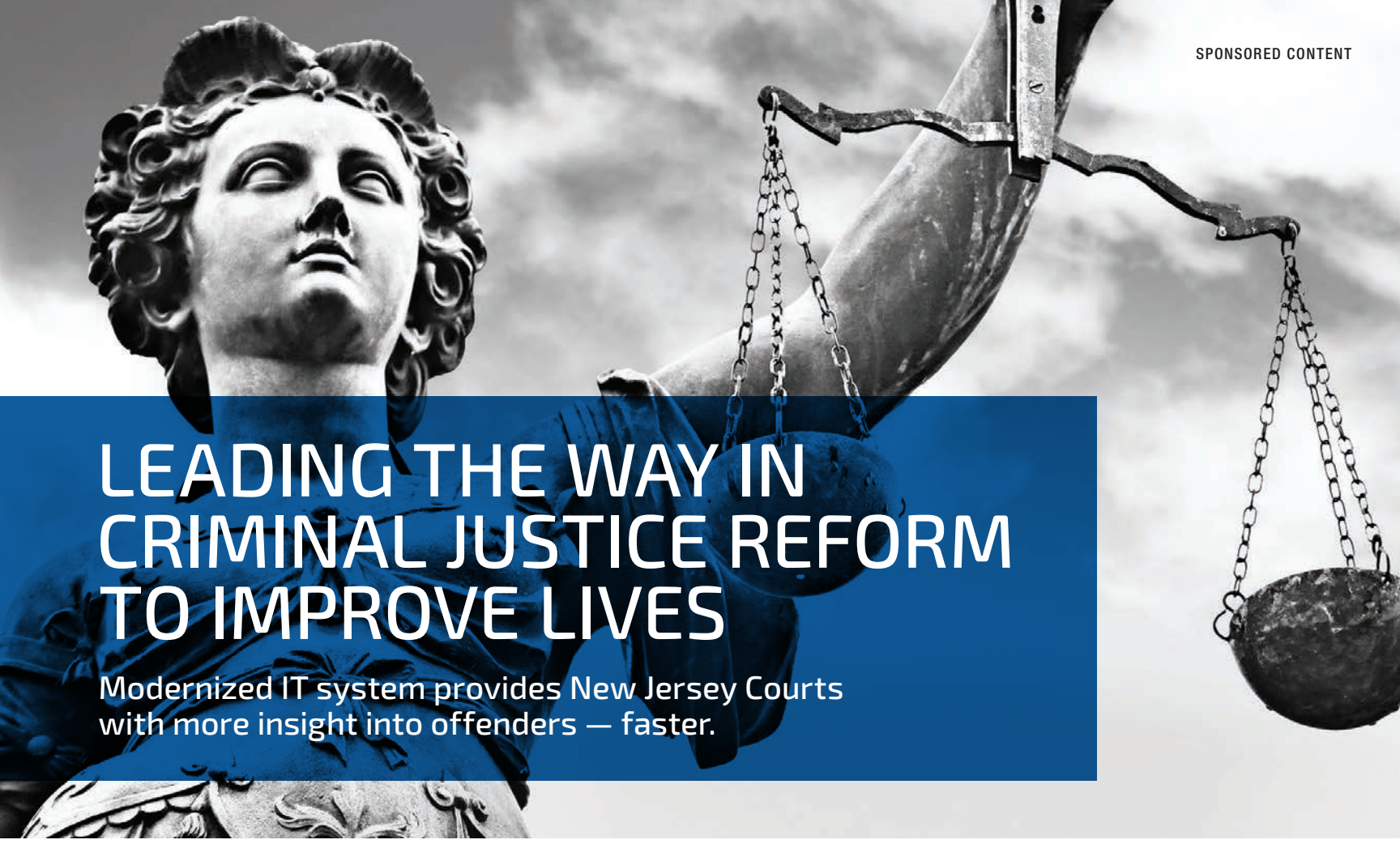
Michael Cockrill
Washington

As we started to talk to agencies, I saw tons of patches of agility. So we're really focused on nurturing that agility, rather than trying to do a top-down transformation.

David Behen
Michigan

The waterfall approach was good for some things, but we think that agile makes a lot more sense because you're so much more engaged with your customer. There are challenges with it too, around training staff and educating customers. But we're definitely moving more into agile.

PHOTOS BY: DAVID KIDD



LEADING THE WAY IN CRIMINAL JUSTICE REFORM TO IMPROVE LIVES

Modernized IT system provides New Jersey Courts with more insight into offenders — faster.

The people of New Jersey have spoken, voting to eliminate bail for crime suspects in most cases. The idea is to release non-violent suspects who pose little flight risk quickly — and who often can't afford bail — but detain dangerous offenders while they await trial, even if they can post bond.

The new law takes effect in 2017, with a pilot program launching in 2016. To succeed, court officials face hiring hundreds of new employees.

To reduce those costs and help judges make more informed decisions, New Jersey Courts is implementing a business process management and risk assessment system on a unified enterprise platform. An application called Public Safety Assessment will crunch the courts' existing data to help determine whether the person is dangerous or a flight risk, says Jack McCarthy, CIO for New Jersey Courts.

The technology, built on Pegasystems, culls records from the courts' vast legacy systems using approved business rules determined by a third party to automatically provide a numeric score based on past behavior. Did the suspect attend previous court dates? Has he or she committed violent crimes? Not only will the system offer New Jersey Courts insight into who to release or detain, it will also reduce employee time spent manually assessing each defendant. What once might have taken a few hours can be done in seconds.

In addition, Pegasystems will unify and analyze all relevant materials on the defendant's case in a single platform, empowering judges with the information they need, when they need it.

Paying for Itself

McCarthy is already predicting full return on the technology investment within a couple months of program launch. And he says the solution will reduce new hires needed by at least one-third, saving up to $15 million annually.

State leaders are looking into other areas where automated risk assessment can provide critical insights, such as background checks on adults living in a home when placing a child or evaluating the necessary level of supervision for probation candidates.

"We're like a toddler who just stood up and took our first few steps," McCarthy says of modernizing the state's existing technology. "We're already seeing huge benefits."

Perpetu
Beta

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al

Another aspect of the non-traditional IT modernization movement is the concept of software or a system in the beta development stage for an extended or indefinite period of time. The idea has its roots in open source development, where "release and release often" has been the mantra. Tim O'Reilly, an open source advocate, has pushed the idea of perpetual beta, in which users of the software become co-developers and the software is developed in the open, with new features added over time. O'Reilly has pointed to several major software services, such as Gmail, Google Maps and Flickr, that have kept a beta moniker on their sites for years.

In government, the use of perpetual beta development has taken hold in the area of web portal redesign. State and local governments have been stepping up efforts to reduce the clutter and complexity of their websites, some of which have tens of thousands of pages, and many of which never see the light of day. Meanwhile, many of the sites are weighed down with videos, audio and plugins, slowing their response time and leaving users frustrated. Most importantly, the first versions of most government websites were designed with content organized by department, not by user need, a shortcoming that many jurisdictions realize is limiting and confusing to citizens.

To modernize, design teams are trying the perpetual beta approach to improve not just home pages, but the entire website. The city of Philadelphia is overhauling its website and has dubbed the operation "alpha.phila.gov." The existing site has more than 66,000 pages of content organized by department. To find information about property, for example, users must visit five web applications. The new website, called "alpha" rather than "beta," will flip the way content is found, organizing it based on user need and making it simple to find.

The city of Boston took a similar approach. Like Philadelphia, Boston's existing website is loaded down with content, some of which seems locked in a labyrinth. It has the classic look and feel of a city website, with a three-column home page featuring drop-down menus, photos and plenty of buttons to click. But the beta version of the city's website is so clear of clutter it's startling: just a single photo of the city's skyline with a few words and one menu button in the corner.

Lauren Lockwood, Boston's chief digital officer, prefers to call the new site a pilot. But whether it's beta or pilot, the new site "is quite obviously not a finished product," she says. In fact, the early version of the new site had just four pages to it, compared to the more than 20,000 that comprise the existing site. "It's important that the website is never done," she says. "We should never be waiting until something is done." But the idea is to test new ways of interacting with users and to generate feedback that can make it better. The subtitle for the project aptly puts the work as the "testing grounds for the city of Boston's website."

Peer-Driven Plays

Here's what agile and iterative deployments look like in the real world.

Government agencies have been somewhat slower than private businesses to adopt agile and iterative development techniques on a large scale. But that's changing as public CIOs seek to speed up development cycles, reduce project risk and boost collaboration between end users and software developers. Here's how government jurisdictions are using agile and modular approaches to get better results in a range of enterprise projects.

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Medicaid's Modular Future

Ask someone what might be the biggest enterprise IT system in state and local government and the answer will likely have to do with Medicaid, the largest non-educational program run by state governments. Medicaid management information systems (MMISs), the key technology behind the processing of Medicaid claims and the costliest IT component in the health insurance program, have been built in the traditional big bang approach. As a result, they have suffered from the types of problems that this kind of development generates. A 2012 analysis done by the state of Colorado found "21 of the last 21 MMIS implementation projects over the last 10 years have been late, over budget, failed or some combination thereof."

To break this record of IT failure, the Centers for Medicare and Medicaid Services (CMS) recently changed its funding rules so states could deploy new MMISs in logical pieces or modules. Modularity gives states a pathway toward the incremental implementation of these systems. In addition, the CMS encourages states to use existing commercial software and/or cloud-based services as they create these modular systems.

One of the states to take advantage of the new rules is Wyoming, which is moving toward a modular, Medicaid-as-a-service solution. The **Alabama** Medicaid Agency has also embraced a modular framework for its new eligibility and enrollment system. The developers worked with Medicaid staff using an agile design methodology to create the system in an iterative and incremental fashion. Completed in 2013, the new system was launched on time and is expected to save $20 million in state and federal funding, according to the Alabama Medicaid Agency.

Building a Foundation for Successful IT Modernization

State and local agencies are using more than half of their IT budgets to maintain outdated systems according to research by the Center for Digital Government. The need to modernize — and quickly — is clear. But the path to modernization can be murky. Cost overruns, missed deadlines and even project cancellations are common hazards.

IT projects across government are unique. Human services, transportation, motor vehicles, finance and more will all have distinct requirements and specifications. However, the successful approach to modernization is remarkably similar regardless of agency or IT system.

Well-Defined and Designed for Manageability

Project success must be built-in from the beginning and projects must be well-defined and designed for manageability. Mathtech believes there are seven critical components to every IT modernization. By confronting these components, IT leaders can build a foundation for success.

For more information, visit www.mathtechinc.com/pcio

MATHTECH, INC.

Yogi Berra once said, "If you don't know where you are going, you might wind up someplace else." And so it goes with IT projects.

Mathtech's 7 Critical Components of IT Modernization Projects

Goals and Vision

Yogi Berra once said, "If you don't know where you are going, you might wind up someplace else." And so it goes with IT projects. The foundation for any successful modernization project is for leaders to understand where they want to go. Mathtech helps agencies develop a vision that addresses the needs of their agencies and stakeholders.

Project Implementation Strategy

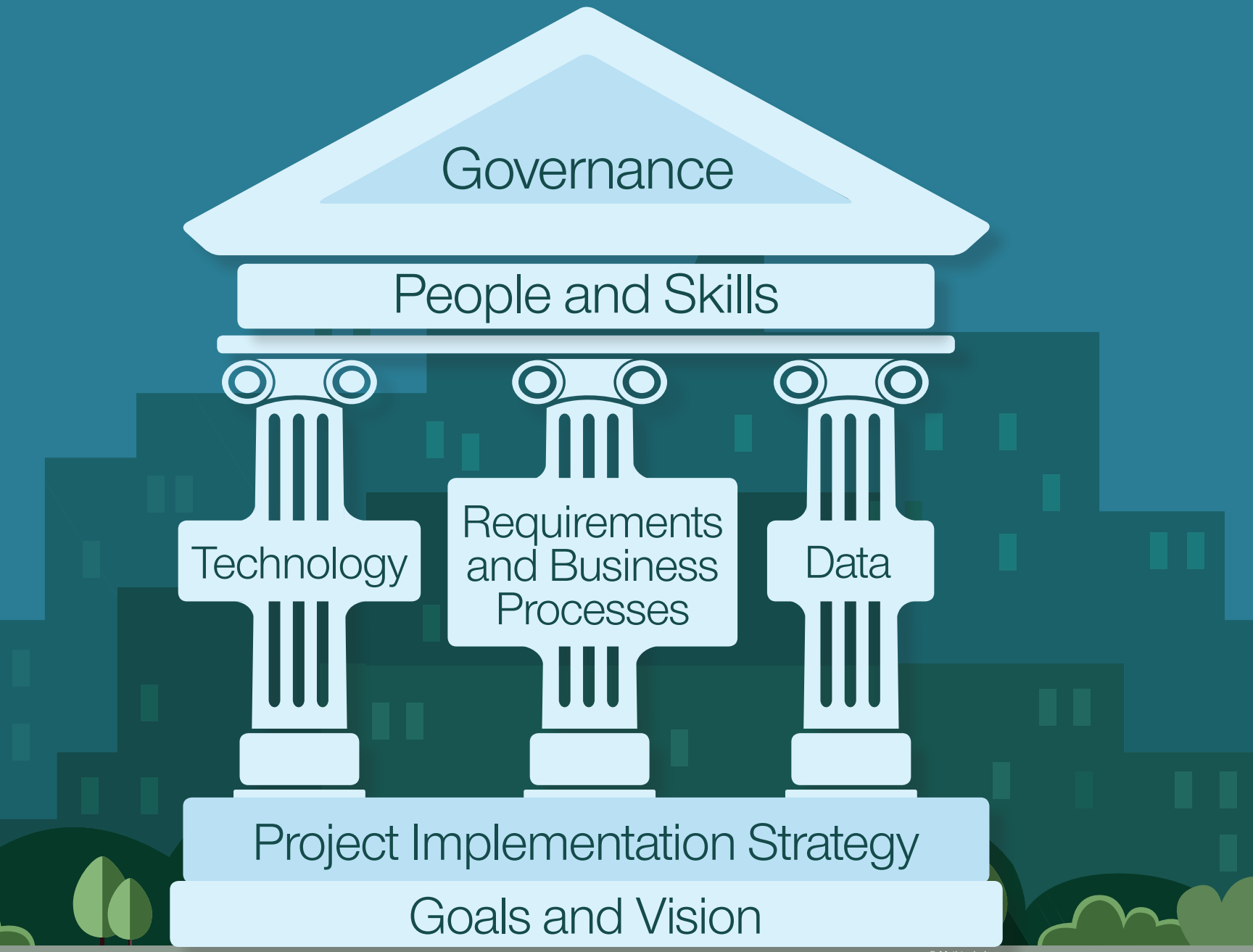
Projects must have a thoughtful plan and be designed for manageability. Mathtech helps leaders identify project phases, make realistic cost estimates, and address project risk.

Technology

Agencies should own the key technology decisions. Mathtech helps agencies understand the technology aspects of the project and develop an approach consistent with their current investment and future direction for infrastructure, standards, software, hardware and maintainability.

Data

The computer science axiom "garbage in, garbage out" rings true for IT modernization. Data outlives any software system and requires planning from the beginning to define it, assess its quality and migrate it to the new systems.



Requirements and Business Processes

IT leaders must understand — and prepare for — how business processes will change due to a system modernization. Mathtech's approach leverages an upfront analysis of processes and plan for improvement that supports the vision.

People and Skills

Employees and their skill sets are a critical aspect of a modernization effort. Insufficient staffing and skills can become overwhelming. It's important to set expectations from the beginning and plan to address the future technical skill sets staff may require for modernized IT systems.

Governance

Governance is not the same as project management. Governance requires leadership that can assess, prioritize and coordinate project efforts and the impact on the organization. Mathtech helps agencies develop governance models for the project and the entire agency that focus on progress.

Protecting California Kids

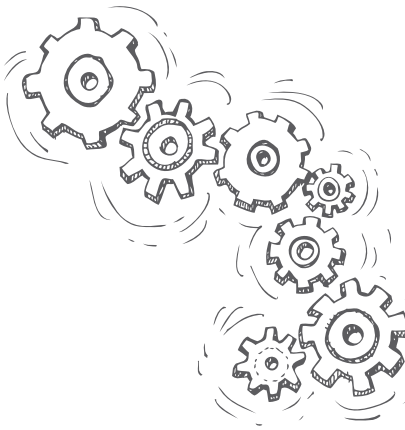
California's decision to modernize the nation's largest child welfare system using agile practices has put the project in the forefront of IT development for states. So far, California has issued two RFPs: one for an application programming interface (API) layer on which developers can build modules to communicate with the existing DB2 database in the legacy application; the other for an intake and emergency services module. The state expects to announce vendors for these two projects this summer with the goal of rolling out usable software for child welfare professionals in 2017, according to Boule.

On the Road in Texas

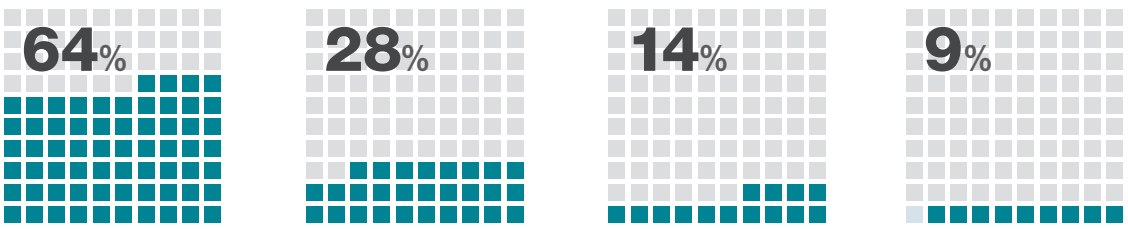
The **Texas** Department of Public Safety created a new online vehicle inspection tool in just eight months using agile development. Built in 2013, the tool replaced a system that had taken a previous vendor 18 months to develop. The new system was built iteratively by three teams of workers from DPS and Texas.gov. Erin Hutchins, director of portal operations at Texas.gov, says close collaboration between DPS and her agency kept the project on course, even when adjustments were needed. The agile approach held stakeholders accountable and kept them engaged, Hutchins told *Government Technology* in a 2013 interview.

Modernization Strategy:
An evolving mix of technologies and approaches

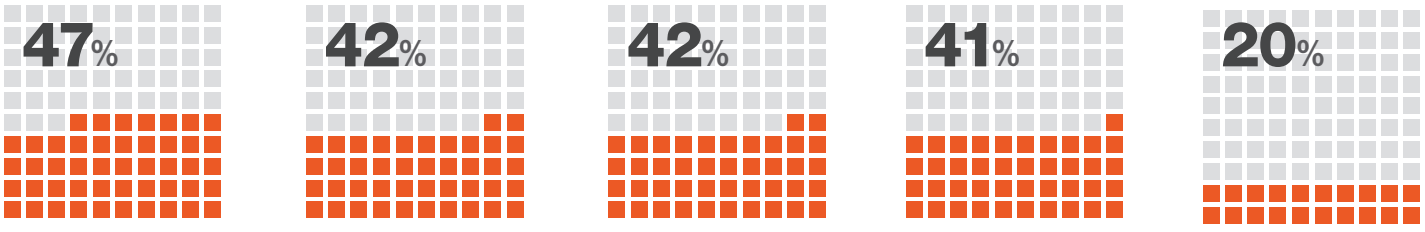
Results from our survey show big bang deployments are giving way to modular and iterative approaches. In addition, the cloud now factors heavily into modernization plans.



Deployment approaches



Technology strategies



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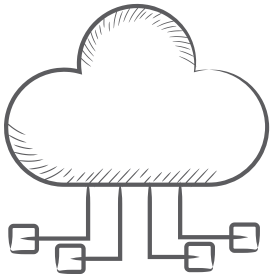


The Impact of Cloud

Modernizing how government develops enterprise IT systems and services goes beyond the methodologies of agile and beta. Cloud computing has given states and localities a highly versatile platform on which to design, develop and test new systems using agile and beta processes. The cloud is also a valuable source for online development tools. It's where the best code repositories are based; the best tools for scrum projects are based; and its where you'll find the best integration and development frameworks.

Michael DeAngelo, deputy CIO for the state of Washington, says the cloud has given incremental development a leg-up on traditional development practices, because you can divide projects into smaller pieces and just pay for what you need. "That's harder to do with physical, capital expense kinds of things," he says. "When you have to invest more upfront, it forces a project into a higher level of justification as far as planning and stakeholders are concerned."

Without the cost that big bang development entails, cloud frees up agile practitioners to become more innovative.

Washington's Agile Example

Washington State's BizHub, a one-stop online portal for small- and medium-sized companies that need to conduct business with the state, offers an example of what agile can do. The project, mandated by the state legislature, was originally planned as a waterfall development that would have cost $8 million and taken up to 5 years to complete, according to state CIO **Michael Cockrill.**

Instead, the project was reset for iterative development using agile practices. Each increment of the project was funded at $750,000, with the goal of having working software in a beta version before funding the next cycle. "The entire project ran along agile lines," says Cockrill. "We wanted this to be the example for the rest of government to show how an agile IT development project could work. We consider it the best example of a cross-agency, cross-functional IT project. The legislature now understands how it works and it's what they have come to expect."

Ohio's Tax System Turnaround

In 2008, the state of **Ohio** awarded a fixed-price, $52 million contract to a systems integrator to integrate more than 20 legacy tax systems. Four years later, after missed deadlines, the state had little to show for the time and money spent on the project. A shift from waterfall to agile in 2012 turned the project around. Today, 14 of 23 tax types have been integrated, and 6 more are scheduled for completion by October. In addition, the project has been expanded to include a $13 million front-end system that allows citizens to file taxes electronically.

Mark Walker, the system's project director, says agile, with its shorter, more collaborative development cycles, brought the state and vendor closer together to work in a more iterative fashion. Walker attributes the project's success to agile and executive support. Without leadership buy-in, Walker would not have had access to the best employees for long stretches of time, he told *Government Technology* earlier this year.

The Journey to Storage Modernization

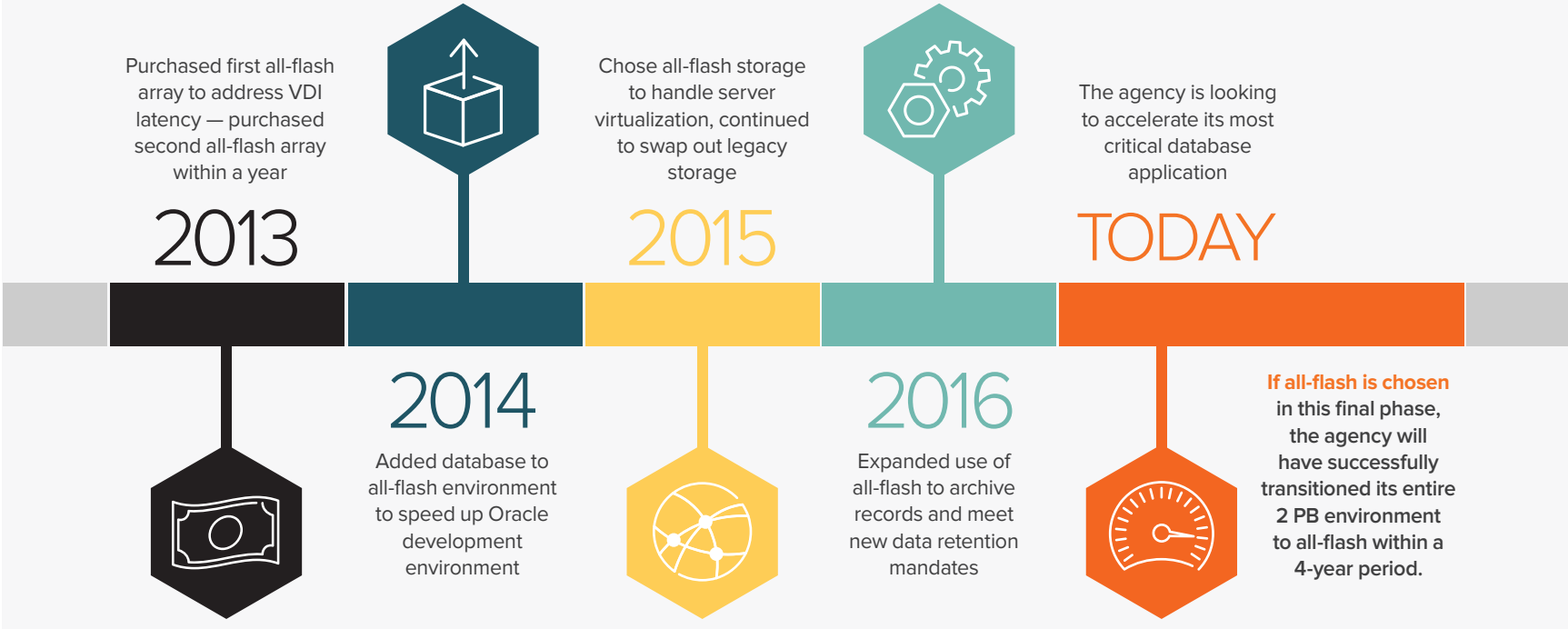
A Platform to Handle Tomorrow's Demands, Today

In 1956, IBM introduced the first disk drive, which was the size of a large wardrobe, had a capacity of 3.75 MB and was leased for $3,200 per month. Flash forward 60 years and hard disk drives are now the last mechanical relics in an otherwise digital data center. So what's replacing the long-standing, large-footprint spinning disk? Flash storage — a cost-effective, scalable, high-capacity, high-throughput storage platform.

By moving from spinning disk to flash storage, government agencies can save time and money while improving citizen services. Legacy technology is costly — 75 percent of the federal IT budget is spent on operations and maintenance, according to the Government Accountability Office. When they just maintain the status quo, agencies can't respond to changing business and citizen needs. Citizens want fast, reliable access to government services from any device.

One Agency's Journey

Agencies need a storage platform that can handle these modern demands. Leaders at one large government agency recognized they needed technology to propel them into the future and adopted some all-flash storage in 2013. Although they knew they were ahead of the curve in adopting flash, they felt their existing technology was quickly becoming obsolete.



At every stage, the results proved the business case to continue moving to all-flash. In addition to its performance gains, the agency has achieved **78 percent cost savings ($122 million over 12 years)**, and an **80 percent** reduction in power, space and cooling.

To learn more about Pure Storage, visit:
www.purestorage.com/government

PURESTORAGE

DAVID KIDD

rcoming Barriers

Although state and local governments are shifting toward more modern IT development and deployment techniques, progress is slow. Agile is as much a philosophy as it is methodology. It takes a new kind of discipline to make it work correctly. Having systems in perpetual beta can also be daunting. Education and guidance on how to manage agile and beta remains a concern and a challenge for even the best-equipped IT organizations.

Last year, NASCIO surveyed its members on agile and found that nearly every state has some degree of agile development taking place. And states such as Maine and Washington have formalized its use and have staff dedicated to the practice. But the survey also showed the limits of its use. Only 21 percent of NASCIO survey respondents reported widespread use of iterative development. The results are an indication of the challenges going agile or beta presents to public CIOs and their organizations.

Collaboration can be difficult. Agile is a methodology in which the customer works closely with the development staff as a team to achieve rapid results. But achieving such collaboration raises difficulties from the mundane — some people prefer to work alone rather than in teams — to the profound — customers aren't used to the daily work that is involved in development. "With traditional waterfall, the development team gets the requirements, goes off and builds the system over a long period of time and then turns the finished (or nearly finished) solution over to the customer," says Maine's Karstens. With agile, the teamwork between customer and developer is both continuous and rapid from the start.

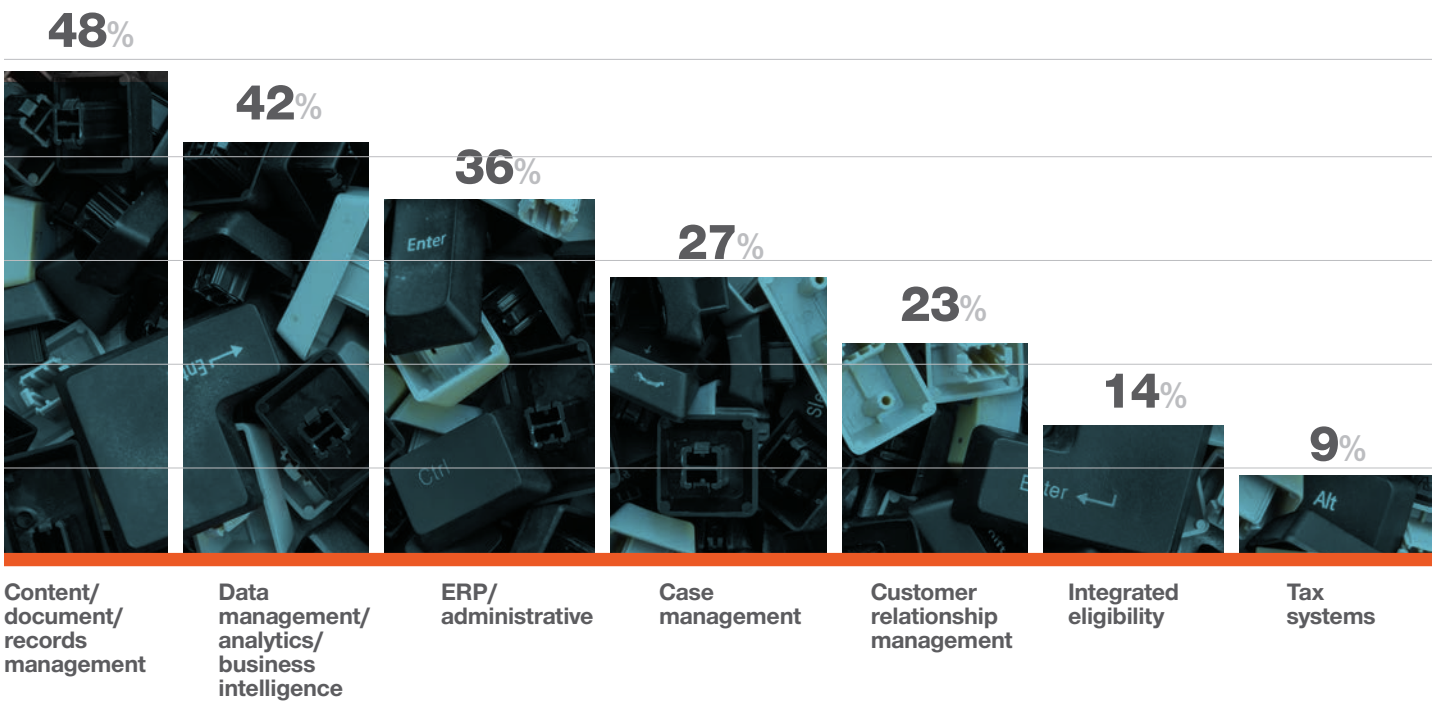
Customers need a new level of commitment. Agile and the iterative process puts customers front and center. They are the ones who understand the project's key business value, and they are empowered to make decisions along the way. That's a level of commitment many end-user agencies aren't culturally ready to provide. "We ran into issues on one project because the customer couldn't make that commitment," says Karstens. "You have to look at those factors: What commitments can they make? What other constraints are they dealing with?"

There's nowhere to hide. Call it the transparency problem with agile and beta development. The iterative process is both rapid and time consuming. Development teams consisting of coders and customers are working in close quarters to produce software that is released for demonstration on a weekly or monthly basis. This kind of process exposes problems in the design early on. But customers can find that a turn-off, says Karstens. They are not used to seeing mistakes and having to correct course so frequently. "I tell them that it just means the process is working," he says. "You would rather have these problems pop up every two-to-three weeks into the project than have

Upgrade Priorities: Where your needs are

Our survey respondents say upgrading content and document management capabilities, along with improving analytics, are their biggest modernization needs.

Which systems in your jurisdiction are in most need of modernization?



Public Procurement for the Postmodern ERP Era

With so much revolving around procurement in government, one would think a modern and efficient process is commonplace.

REALITY CHECK: A recent Center for Digital Government survey of 138 government, IT and procurement decision-makers found 31 percent of respondents don't have a portal or eProcurement system where they can post bids and RFPs online.

Modern procurement simplifies the purchasing process, protects taxpayer dollars and ensures fair competition. In the postmodern ERP era, an eProcurement solution that lives outside of the core enterprise resource planning (ERP) system — but remains tightly integrated — is ideal. Periscope's best-of-breed BuySpeed solution does just that while meeting the unique needs of public sector and offering several additional benefits.

COST SAVINGS.

The #1 benefit that attracts survey respondents to a best-of-breed eProcurement module is cost savings.

BuySpeed costs less to implement and maintain than traditional ERP procurement modules. Periscope Holdings offers a variety of funding options to help agencies get their system up and running quickly.

EASY INTEGRATION.

49% of respondents said they desired a procurement solution that is easier to integrate into processes.

Periscope Holdings' integration framework enables easy exchange of data between the BuySpeed eProcurement module and financial system. With BuySpeed, your system is up and running in months rather than the years it can take for an ERP.

EFFICIENT USE.

40% of respondents said more efficient use of staff time was among the top 3 benefits that attracts them to a best-of-breed eProcurement module.

BuySpeed was created for the public sector by former public sector officials, so its user friendly and tailored to the needs of government. As a result, more employees can take advantage of its efficiencies.

Periscope HOLDINGS INC

Periscope Holdings can help governments bring their procurement processes into the postmodern ERP era with BuySpeed — increasing transparency, efficiencies and competition. For more information, visit: **www.periscopeholdings.com**

to discover them 10 months down the road when it's too late and the cost to correct is going to be too high."

There's probably more to manage. For enterprise agile projects, governments have to step into the role of systems integrator, managing contracts, building modules and publishing specifications that will be used as the foundation for the next vendor. This is the challenge California faces with its child welfare system. It's a situation that veers far from a traditional waterfall deployment where government could take comfort in having a single relationship with a systems integrator. Iterative development, at least in an enterprise IT modernization project as big as California's, means working with multiple vendors, says Boule. "Instead of working with just one integrator, you now have multiple vendors, with government accountable to each vendor, making sure each module is aligning and that the data is being integrated. At the same time, it's up to government to make sure the new system is being built upon a core and steady foundation of technical standards and specifications."

Your procurement office may not understand. On the surface, government purchasing practices aren't so far out of line with modern IT development. "The existing practices in contracting are 80 percent appropriate in an agile context," says DeAngelo. But the problem is in the details.

DeAngelo says one issue is that procurement offices expect development teams and customers to know up front what they are going to build. "It's the waterfall mentality," he says. Waterfall contracting constrains a project's scope by defining requirements, budget and timeframe. With agile, the final product isn't defined. There's less focus on requirements and more attention on making decisions on each iteration.

Coping with Change:
Where the going gets tough

Modular and iterative systems deployment requires changing traditional processes — and that's never easy. Survey respondents said integrating multiple systems and changing internal culture are the two biggest hurdles.

There also should be an expectation that an agile contract can be terminated at every iterative release, says DeAngelo.

Likewise, payment policy in agile shifts away from deliverables, or set milestones, to payment at the end of each sprint when the next iteration of software is demonstrated. This approach removes the traditional practice of setting detailed requirements and then having vendors setting an inflated price for delivering what actually ends up being delivered. "In agile, vendors like the idea of periodic review of their work and being paid based on what they have produced," says DeAngelo.

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Meeting Citizen Demands for Digital Services – Without Rip and Replace

Government Under Pressure to Modernize

The CDG enterprise systems survey shows that state and local agencies are riddled with old technology. And constituents – driven by personalized transactions offered by commercial businesses – are beginning to expect higher levels of service from government than legacy systems can deliver.

For agencies under pressure to modernize, the path toward meeting these demands is incremental. Large, multi-year IT projects are infamous for high failure rates and hefty cost overruns. Today's agencies need off-the-shelf software and services that let them create a platform for launching new citizen-friendly services one by one.

Adding Functionality to Existing Systems – Incrementally

Adobe offers traditional or hosted solutions that let agencies incrementally add new functionality to existing systems, enabling them to meet citizens' demands for digital services without ripping out still-functioning legacy technology. It's an approach that dramatically cuts the cost and time required to launch innovative offerings like one-stop citizen portals and convenient business gateways.

"You can take your legacy systems and expose them through incremental modernization for citizen interaction," says Kumar Rachuri, former CIO for the Ohio Department of Job and Family Services who is now Director of State and Local Government Solutions for Adobe. "Your systems of record are still intact. But you've given citizens self-service functions that make them happy and lighten the data entry burden on agencies."

Better Services, Faster

Citizens don't just want more services from government, they want better services. Human-centered design will be essential as agencies launch new service offerings, Rachuri says. This approach requires designers to put user experience at the center of building new service offerings. Many leading commercial organizations use this technique, and it can help governments drive both adoption and satisfaction.

Achieving higher levels of service also will demand more data sharing, both between government and citizens and among various back-end systems. Adobe solutions protect this data while it's at rest and in transit with security policies that automatically follow information regardless of format or mode of transmission.

> **" The citizen experience needs to be personalized. It needs to be relevant. And it needs to be in real time."**
>
> - Kumar Rachuri

Transforming Government

Ultimately, Adobe enables agencies to incrementally launch new digital functions and tap into rich data to transform government services.

"Today, agencies need to leverage the information they're getting from citizens to provide a more meaningful interaction," says Rachuri. "The citizen experience needs to be personalized. It needs to be relevant. And it needs to be real time." Agencies can achieve this automation and lower the cost of operation while improving citizen satisfaction by delivering quality service on demand.

Steps in the Right Direction

Four tips for becoming agile and iterative

The GAO has identified 32 best practices it considers effective for applying agile software development methods to IT projects. These practices generally align with five key software development management activities: strategic planning, organizational commitment and collaboration, preparation, execution and evaluation. Public CIOs would agree with these practices and would add some more specific sets of guidelines:

1 Start with a vision and strategy.

Not all IT projects are perfect fits for agile or beta. Certainly, smaller IT projects might not benefit as much from agile as would a large project (i.e., California's child welfare system). Understanding your vision for the project will help guide the best approach for development. A good strategy also will keep the project on track and avoid a stall-out. Lauren Lockwood, Boston's chief digital officer, mentions that with beta projects, feedback is a crucial aspect of development. Yet too much feedback can hurt rather than help.

2 Leadership is a must.

Both agile and beta are highly collaborative efforts to develop IT. But both practices demand executive buy-in and commitment. Most government agencies also still operate in silos, which is not conducive to an agile approach to enterprise software development. And the faster pace of agile can cause problems for agencies accustomed to moving at a slower pace. "Sometimes the policies within an agency are not set up to handle the faster pace of agile," says Maine's Karstens. "You need a leader who knows whether or not the organization can support the agile approach."

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3

Focus on stakeholders.

Agile projects require the ongoing collaboration and commitment of a wide array of stakeholders, but especially the business owners and developers. California's child welfare system offers an extreme example. The system will be used by the state's 58 counties, which range from less than 10,000 people to Los Angeles County, the largest county in the U.S. by population. That makes involving stakeholders both daunting and vital, according to Boule. "This is a development project centered on the user," he says. "Under the old, monolithic approach, we would get what we asked for, but it wasn't exactly what the end user needed or wanted." That's going to change under agile, with development teams going out to the counties so they can participate in the iterative process.

4

Think value, not savings.

Talk to CIOs about the money side of agile and it's clear that spending less is not the goal. "Moving to agile was not done for cost savings reasons; it was to get usable software faster," says Boule. It's also about managing risk and producing value. "We've seen big projects go off the rails and produce little if any value in the waterfall method, whereas with agile, you can capture some value even if a project runs into problems because the end user has been involved from the start," says DeAngelo. "There's way too much risk in starting a project that doesn't deliver value for three to five years."

Conclusion

Tools + Process + People

It's time to take modernization to the next level.

At the beginning of this year, West Carrollton, Ohio, population 13,000, began to overhaul its website. Within 60 days, the city launched a beta version of what will become its digital portal. The development project was a collaborative, public-private process using agile sprints and weekly team calls. The technology used to build the website is a popular open source content management system. During the beta testing period, the city collected valuable citizen feedback through online surveys and analytics tools.

As this report has shown, the door to modernizing enterprise IT systems in new ways has been open for some time. But only recently has the use of agile and beta practices taken hold in the public sector. The traditional waterfall methodologies are still deeply ingrained in how IT development is done.

West Carrollton and others demonstrate that the pieces for a new approach are already out there: agile, beta, open source, the cloud, online development tools and digital feedback mechanisms. Bring them together and you have the makings for a new way of deploying government software systems without the risk, high cost and the innovation-killing development timelines.

Of course it takes more than just the latest technology and methodologies. There's a new way of thinking built around teams, collaboration and putting the end user at the top of the process. And process is just part of the equation, just as are the new tools available. Ultimately, CIOs have to make sure they have a well-trained workforce to carry all of this out. "You have to have the right people and you have to spend time and resources to train them to think and act in a different way," says Washington's Cockrill, who recommends having a coach to oversee every agile project in which people have to interact in ways they have not done before. "The process is important, but you can't divorce the process from the people."

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Acknowledgments

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The Center for Digital Government, a division of e.Republic, is a national research and advisory institute on information technology policies and best practices in state and local government. The Center conducts e.Republic's annual Digital Cities and Counties Surveys; the biennial Digital States Survey; and a wide range of custom research projects. For more information, contact Executive Director Todd Sander at tsander@centerdigitalgov.com.

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