

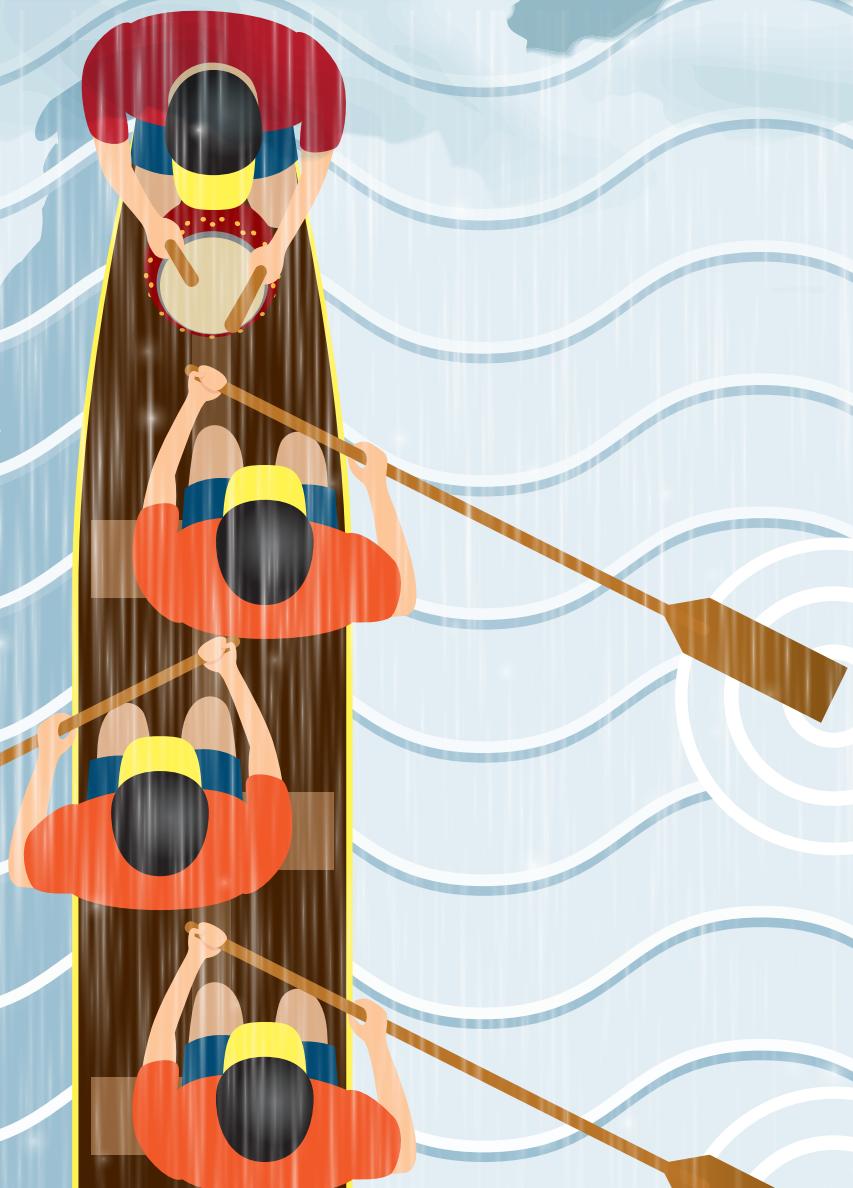
The 2014 State CIO Survey

SEPTEMBER 2014



Charting the Course

Leading Collaboration During Uncertain Times





About the National Association of State Chief Information Officers

Founded in 1969, the National Association of State Chief Information Officers (NASCIO) represents state chief information officers (CIOs) and information technology (IT) executives and managers from the states, territories and District of Columbia. NASCIO's mission is to foster government excellence through quality business practices, information management and technology policy. NASCIO provides state CIOs and state members with products and services designed to support the challenging role of the state CIO, stimulate the exchange of information and promote the adoption of IT best practices and innovations. From national conferences to peer networking, research and publications, briefings and government affairs, NASCIO is the premier network and resource for state CIOs. For more information, visit www.NASCIO.org.



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Executive summary

As major changes continue to sweep through the state IT landscape, we asked state CIOs to share their perspective on the status and future direction of the state CIO organization and the overall enterprise. While the survey covered a wide variety of topics, we asked CIOs to focus particularly on three main topics - the planning and oversight of critical projects, sourcing and the use of data as a strategic asset. These topics share a common theme in that they all require the CIO to establish priorities, collaborate with stakeholders and integrate with multiple external organizations. Whether dealing with large System Integrators, with Cloud services vendors, or with other state agencies, CIOs more than ever before are challenged to seamlessly coordinate the activities of multiple diverse entities.

Planning and Oversight of Critical Projects

Given the continued legislative and media attention devoted to large state IT projects, we began this year's survey with several questions relating to the maturity and effectiveness of IT project planning and oversight practices for high-visibility projects. In the realm of large IT projects, half the states on average are managing at least five projects that they consider to be large or critical with almost three quarters of the states having recent experience overseeing projects with budgets exceeding \$100M. In several states the large, critical IT projects account for over 90% of total project spending. At this point, a large majority of states have some type of criteria for identifying and assessing their largest, most critical projects, even if cost is sometimes the only criterion.

When it comes to oversight, CIOs play a variety of roles with around two thirds either having formal oversight and control, a formal leadership role, or an active advisory role in their state's large and complex projects. Perhaps in contrast to public perception, over

a third of respondents stated that in general all their recent larger projects had been successful.

Although perceptions of success may also differ depending on the perspective of the stakeholder, almost all other responding CIOs characterized their results as mixed. While states may not be uniformly achieving success in their most critical projects, these results do indicate that broad generalizations about the inability of states to successfully complete projects are overblown.

When CIOs were asked what factors they felt had the greatest impact on project success, by far the most common responses were executive sponsorship, effectiveness of governance, and effectiveness of project management. CIOs also emphasized the need for strong procurement and vendor management practices, and the need to transition to a more incremental approach to project implementation.

Sourcing

While the ownership and operation of the data center is characterized by heightened consolidation and CIO ownership, outsourcing of some IT applications and services has grown at a strong pace - nearly doubling from 42% of states to 81% in the last four years. To keep up with the challenge of the changing technology services landscape, CIOs are increasingly examining and adopting varied IT sourcing and service delivery models. The 2013 survey indicated that CIOs no longer feel that there are significant barriers to use of different sourcing and business models, and the 2014 survey data reflects an uptick in use of novel arrangements. In assessing their ability to move forward with a sourcing strategy to implement managed services, most CIOs felt that they had the appropriate policies, including security in place, as well as the contractual Service Level Agreements



and supporting terms and conditions. While there are still some concerns, surprisingly, no CIOs responded that they had any statutory prohibitions that would prevent them from implementing managed services. In 2014 the area of managed services acquisitions seem to be an area where the CIOs display a “moderate” level of confidence in their state’s procurement agency and processes and that their organizations would have less of a problem transitioning to a managed services environment than first thought.

Managing Data as a Strategic Asset

The growth of digital data, especially unstructured data, is dramatically increasing in state government. State agencies and CIOs are wrestling with the challenges of data governance, opening legacy system data to wider access, using data in new ways to support program performance and service delivery, and simultaneously managing major new flows of data from new sources. The growth of unstructured data from new sources and devices has added more complexity to this discussion.

The survey questions captured the CIOs’ assessment of state data management, governance structures, current roles, and future plans. The 2014 survey questions tapped into a subset of enterprise data – business intelligence and analytics, capturing the CIOs’ assessment of information sharing/exchange in their states and the prevalence of “open data” portal use in the states. Responses revealed that states differ widely in their data management approaches and capabilities. The majority of CIOs (54%) reported an increasing level of professional discipline around management of state data assets with an additional 10% reporting having a formal data governance structure, roles and responsibilities, and tools. Enterprise data management presented a more fragmented picture, as states programs and practices ranged from comprehensive and fairly mature to narrowly-focused and immature. CIOs see a proliferation of possible roles and responsibilities for their organizations – with the

largest numbers focused on taking the lead in advocating for data as a strategic asset (80%) and on the need to develop an enterprise data strategy (86%).

Open data practices and tools have become more common. Governors and other state leaders are advocating for “open government,” so states are pursuing open data and supporting it with legislative authority. A surprising 48% of respondents indicate that their state is up-and-running with an open data portal. Those who see impediments to further information-sharing via data portals cite agencies unwillingness to publish data as the primary roadblock. With regard to “Big Data” most states and CIOs are still firmly in the pre-evaluation or evaluation phases – more than 63% report that they are either considering big data investments or have yet to move into big data in any way. Regarding the progress of state agencies toward full-fledged information sharing, respondents reported that agencies remain in the early phases of adoption – with 68% of states characterized as “fairly protective and risk averse” and another 36% falling in the category of “beginning to make headway, agencies are seeing the value.”



About the Survey

Survey purpose

The National Association of State Chief Information Officers (NASCIO), TechAmerica, and Grant Thornton LLP have collaborated for a fourth consecutive year to survey state government IT leaders on current issues, trends and perspectives. The continuing economic situation creates problems for states when citizen demands for services continue or grow. The survey sponsors seek to provide these state government IT leaders with an opportunity to voice their thoughts and opinions on matters of high importance. Governors, legislatures and business leaders can benefit from these knowledgeable insights about essential state IT services.

Methodology

In Spring 2014, the sponsors jointly developed a series of questions reflecting both the new issues of the day as well as follow-up on some of the questions they included in the 2013 survey. The questions were presented to state CIOs in an online tool, and between June and August 2014, they individually logged in and addressed the 42 multiple-choice and open-ended questions.

The response rate was extraordinary with 52 of the NASCIO member states and territories completing the survey. Primary respondents were the state CIOs, although deputy CIOs and other senior state IT leaders contributed. Throughout the survey, we refer to them all as state CIOs. Thirty seven of the respondents also participated in the 2012 survey. However, new perspectives were introduced by 30% of the respondents who are different due to the normal turnover that occurs in state CIO positions. We also conducted in-person interviews with 18 state CIOs and incorporated their “advice from the trenches” along with the quantitative and qualitative responses to the online survey.

This survey occurred while states are experiencing the slow fiscal recovery from a deep recession. For fiscal year 2014, the outlook is better as the revenue situation in most states is positive and budgets are more stable. However, targeted spending cuts remain and slow revenue growth will constrain state budgets for the near future. Spending on health care continues to crowd out resources required for other



state services and governors are focused on improving quality while managing rising costs. In addition, the impact of federal sequestration and reduced aid to states is beginning to effect the delivery of state services.

As with many state leaders, state CIOs are faced with demands to reduce operational costs, introduce innovation and continue to provide the technology leadership and support to allow their states to provide essential services to their citizens.

Anonymity

This report reflects the responses and opinions of the survey respondents to the maximum extent possible. However, to preserve anonymity we do not attribute responses to specific individuals.

To obtain a copy of the survey report or questionnaire, please see the inside back cover of this report for directions to the sponsor organizations' websites.

Planning and Oversight of Large, Critical Projects

The largest, mission-critical state IT projects continue to receive significant exposure and attention, both from state legislators and from the media. A number of highly publicized project failures in the past twelve months – particularly those related to Affordable Care Act (ACA) implementation – have reinforced a general perception that states continue to struggle to implement the most complex and important projects. This perception – whether warranted or not

– ramps up the pressure on state CIOs to improve the planning, management and oversight of large, critical IT initiatives. To begin this year's survey we asked several questions relating to the maturity and effectiveness of IT project planning and oversight practices for these high-visibility projects.

Figure 1

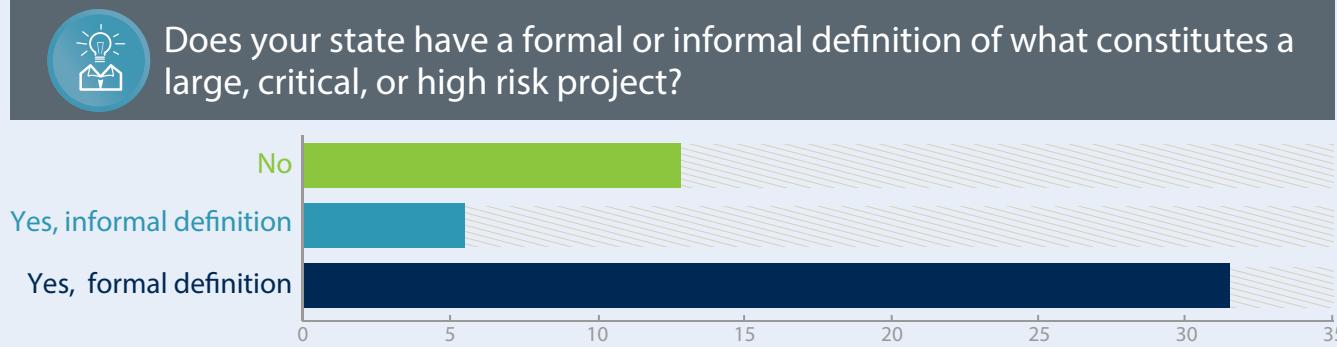
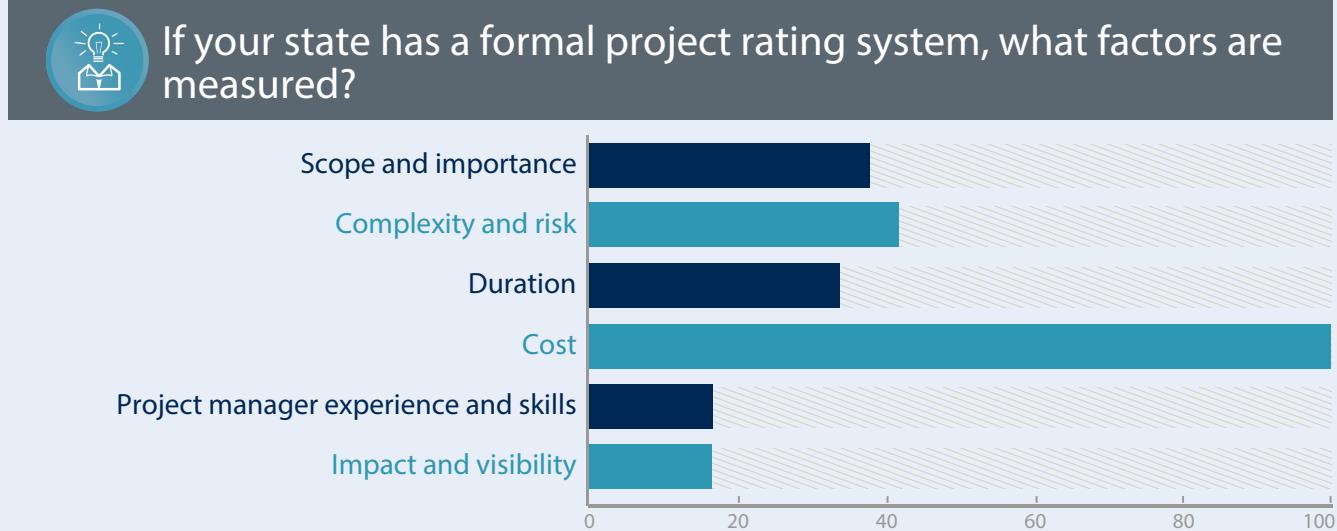


Figure 2





At present, a large majority of states have some type of criteria for identifying and assessing the largest, most critical projects. Criteria vary, with cost sometimes the only criterion. The actual dollar value that qualifies a project as ‘large’ varies significantly by state. In some states however a more balanced scorecard approach is used that incorporates consideration of the project’s importance to agency mission, level of visibility, duration,

and perceived level of risk. A few states also make a formal assessment of the skills and experience of the project manager and their team.

Based on these criteria, we asked CIOs about the characteristics of their large, critical project portfolio.

Number of projects

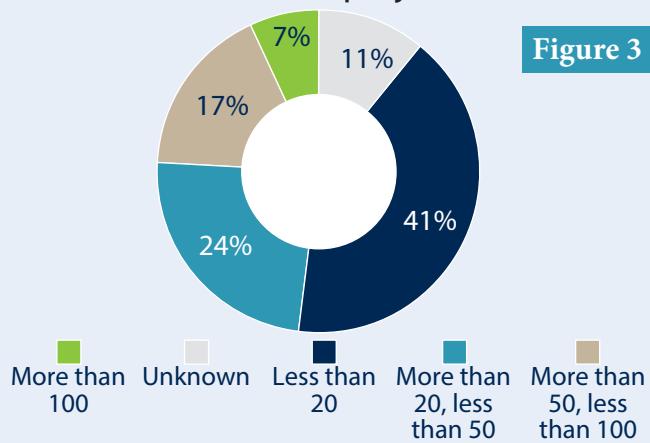


Figure 3

Value of largest project



Figure 5

Average Dollar Value

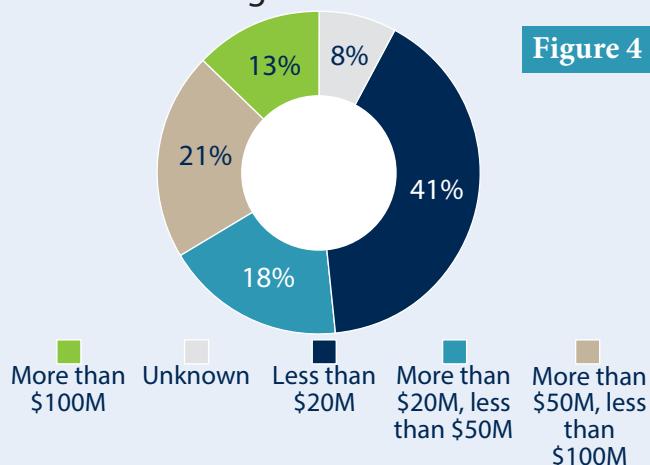


Figure 4

Percentage of Total Portfolio Budget for Large Critical Projects

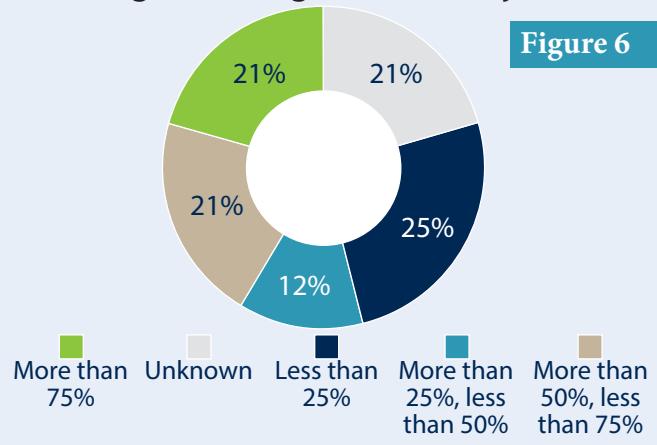


Figure 6



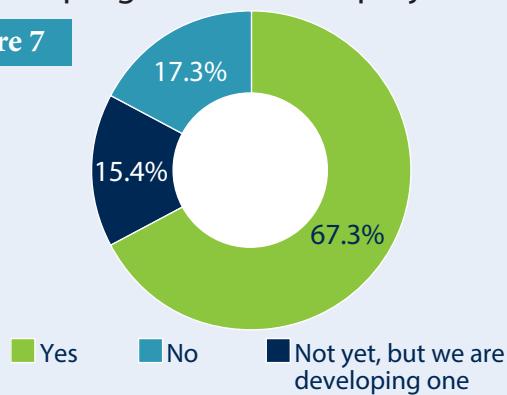
Not surprisingly – given the differences in definitions and scale across the states – there was a wide variety in the responses. However, several conclusions can be drawn:

- Each year over half the states are on average managing at least five projects that they consider large or critical.
- The dollar value of these projects varies significantly across states, but almost three quarters of the states have recent experience overseeing projects with budgets exceeding \$100M.
- The thresholds used to classify projects as large or critical vary significantly across states, and they also vary in respect to the total value of the project portfolio. The states are almost evenly distributed in terms of how much of the value of the project portfolio is taken up by large, critical projects. In some states it is less than 25% while in others these projects consume over 75% of the total project portfolio budget. In several states the large, critical projects account for over 90% of total project spending.

We then asked CIOs about whether their state used a formal ongoing review and rating system to track the progress and health of these projects.

Does your state have a formal review/rating system for tracking the progress/health of projects?

Figure 7



Almost all states have such a system in place or are currently developing one. As shown in the chart below, the factors tracked by these systems are fairly uniform across the states.

Figure 8

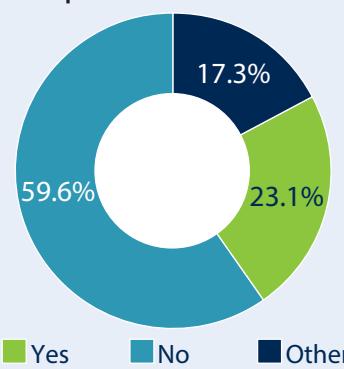
If your state has a formal project rating system, what factors are measured?

Schedule variance	92.1%
Budget variance	84.2%
Level of risk	86.8%
Achievement of business objectives	71.1%
Quality work products/software	44.7%
Quality/experience of staff	44.7%
Stakeholder communications and acceptance	57.9%
Effectiveness of governance	44.7%
Effectiveness of project management	57.9%
Other	18.4%

One area of significant diversity among states however is the extent to which project tracking information is available to the general public. We asked CIOs whether their states provided a publicly available dashboard of project health information.

Is there a publicly available dashboard that tracks project performance?

Figure 9





Less than a quarter of states currently host a publicly available dashboard. However, respondents indicated that approximately twenty percent of the other states are in the process of creating one. This implies that within the next year or so almost fifty percent of states will make the status of their largest, most critical IT projects available to the public. There is growing pressure to provide this type of project transparency, however this is often challenging for the CIOs that don't have enterprise visibility across all state agencies.

We then asked CIOs about their personal role in the planning and oversight of these types of projects.

Figure 10

What role do you play in the planning and oversight of large, critical projects?	
Not at all involved	0%
Somewhat engaged in an advisory capacity	21.2%
Actively engaged in an advisory capacity	67.3%
Leadership role in these efforts	61.5%
Control planning and spending for these systems	26.9%
Informal oversight and control	23.1%
Formal oversight and control	69.2%
Don't know/does not apply	0%
Other	9.6%

While CIOs play a variety of roles, around two-thirds of CIOs have either formal oversight and control, a formal leadership role, or an active advisory role in their state's large and complex projects. There are a minority of CIOs however who either have only informal oversight or who are less engaged in an advisory capacity. One CIO uses an enterprise level Project Management Office (PMO) and said it acts as a "canary in the mine" by providing internal oversight of projects. Another stated that the CIO needs to be clear about their involvement in each project – "lead, follow or get out of the way."

Figure 11

What factors drive your level of involvement in these types of projects?

Project cost	71.2%
Project risk	21.2%
Statewide/cross-departmental impact	80.8%
Executive branch directive	71.2%
Legislative directive	65.4%
Other	9.6%

The level of involvement of the CIOs in any particular project is driven by a fairly uniform set of factors.

Figure 12

Are there other bodies in the state with a defined role in the oversight of large, critical projects?

State auditor/inspector general	43.5%
Legislature	52.2%
Mandated contract IV&V or independent oversight	63.0%
Other	32.6%

A significant number of states also have other bodies with a formal role in the oversight of large, critical projects. Interestingly, almost two-thirds of states now have a mandated role for contract Independent Verification and Validation (IV&V) or independent oversight. Contract IV&V is most often used for health and human services-related projects that involve the use of Federal funds.

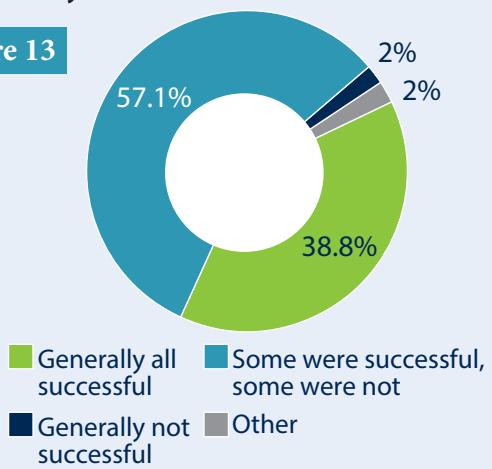
We then asked CIOs about how successful they considered their last several large, critical projects to have been. Perhaps in contrast to public perception, over a third of respondents stated that in general all their projects had been



successful. Almost all other respondents stated the results were mixed. While states may not be uniformly achieving success in their most critical projects, these results do indicate that generalizations about the inability of states to successfully complete projects are overblown.

How would you rate the success of the last several large, critical projects that your state has undertaken?

Figure 13



Perceptions of success may also differ depending on the perspective of the stakeholder. As one respondent stated “‘Success is in the eye of the beholder’ is an apt description of the success rate of the major projects that have been undertaken. Classical objective success factors such as cost and schedule overruns as compared to baseline, scope definition issues, quality metrics etc. seem to be secondary in comparison to stakeholder acceptance when it comes to agreement on whether an initiative has been successful.”

We asked CIOs what factors they felt had the greatest impact on project success. By far the most common responses were executive sponsorship, effectiveness of governance, and effectiveness of project management. CIOs particularly emphasized the importance of

Figure 14

What factors had the greatest impact on the level of success for these projects?

Executive sponsorship	64.6%
Effectiveness of governance and decision-making	58.3%
Effectiveness of project management	58.3%
Effectiveness of vendor oversight and contract management	29.2%
Effectiveness of the procurement and contracting process	25.0%
Vendor experience and expertise	20.8%
Organizational change management and training	14.6%
State staff experience and expertise	8.3%
Independent external oversight with the authority to pause/cancel the project	6.3%
Capability and maturity of the technology	4.2%
Effectiveness of software development and testing	4.2%
Other	6.3%

strong executive sponsorship. Without it none of the other factors matter, and with it many of the other success factors become much easier to achieve. Given the expansive body of research on project management stressing the importance of this factor, this is not surprising. As one respondent commented “All other positive results that emerge from a critical IT project seem to cascade out of the fundamental best-practice of ensuring that executive managers in the agency take ownership of the project status and have a governance role.”



We also asked CIOs what they felt were important best practices or lessons learned that they had taken away from their recent experiences with large, critical projects. In addition to the three key areas mentioned above, multiple respondents mentioned several additional topics:

- **Strong contract management and vendor oversight:** Increasingly, the implementation of the largest and most complex IT systems involves procuring the services of one or more system integration vendors. The management and oversight of these contracts has become a critical skill for states. Many respondents identified the strength of contract management and of vendor oversight as a critical success factor. Specific advice provided by CIOs included the following:
 - “Every project needs an IV&V assigned to these type projects and a strong PMO.”
 - “The use of a PMO, in tight coupling with IV&V and oversight can help defuse the ‘Statement of Work’ stand-off that can exist when there are many dependencies between integration vendors and state agency staff.”
 - “Insure that the vendors know their products. You’ll be surprised as to how little they truly understand their own solutions.”
 - “Do not micromanage the vendor; bring in the best and let them do their job.”
 - “Promote a good team environment with the vendor. Treat the vendor as part of the larger team, and not as an enemy.”
- **Adopt an incremental approach to deployment:** Multiple CIOs advocated a move to smaller, more incremental projects and a decrease in the number of very large, multi-year endeavors. Advice included:
 - “Small incremental value is easier to deliver to your customer than large multi-year cut over projects - Use Agile!”
 - “We have had a recent, sharp focus on keeping the duration of all projects under 2 years. We have found that longer projects are less successful as business rules and leadership continue to change. Larger projects must be broken down into smaller phases that each deliver business value. We have found that this generates multiple release strategies that make success more likely and lessens the project team desire that everything must be crammed into the initial release.”
 - “Iterative, agile development of high quality software is critical - check quality early and often.”
 - “Sometimes it’s tempting to combine two separate projects into a single purchase effort. This is usually a mistake. It’s much better to manage two smaller projects than one big one.”
 - “People think, incorrectly, that by doing things in 1 mega project, they will get it all done sooner. Instead, it takes longer, and often fails.”
- **Importance of the procurement process:** The success or failure of many projects is greatly influenced by the quality of the procurement for system implementation services. Gaps, ambiguities or inaccuracies are much more difficult and expensive to resolve once a (often firm-fixed price) contract is in place. Advice from CIOs included the following:
 - “Pre-award dialog between candidate vendors and the state management team can help the process.”
 - “Understand what motivates vendors; and

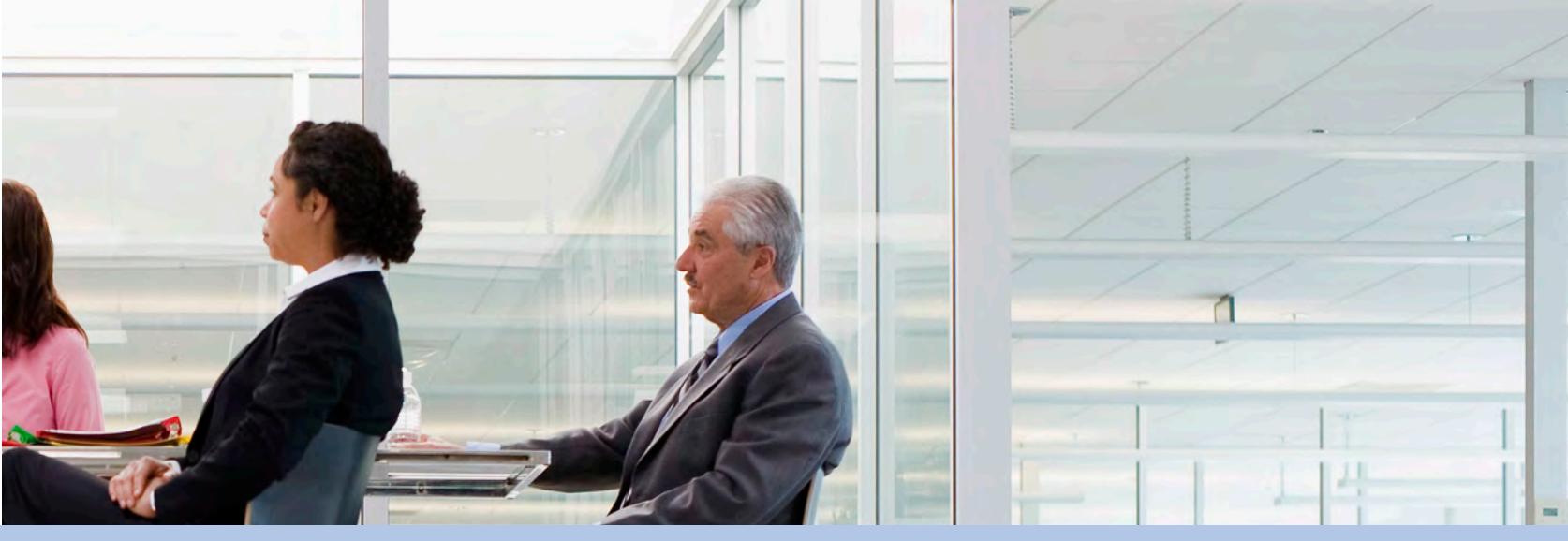


how to meet their needs as well as the state's needs. If not, resentment builds up.”

- “Keep in mind that bad procurements lead to bad contracts, which lead to bad deliverables.”
- “Do not define ‘successful procurement’ as simply an award with no protests.”
- “Tie money in the contract to performance. Successful milestones, functionality working, or even revenue generated, etc. Contractors are good at putting the state on the critical path and then blaming the state for late deliverables and slipping schedules.”
- “Benefits-funded procurements work well. Performance-based procurements forge partnerships (teamwork) to deliver on time, within budget and meet objectives. A performance based compensation model requires bidders to do homework on business objectives, requirements and planning.”

Finally, we asked respondents what advice they would have for a new CIO regarding the planning and management of large, critical projects. The two most prominent themes echoed the lessons above, and involved the establishment of strong executive leadership and governance, and the implementation of rigorous project management. Specific examples included:

- “Establish formal governance early on in the project that consists of a core decision making group that has a vested interest in the success of the project.”
- “Ensure that a formal project management methodology is being followed and that a Senior Project Manager is managing the project or providing oversight.”
- “Have a gate process that reassesses the project over time to determine if the project still meets the original business case. Included in this process is a formal mechanism to end the project if it no longer meets the intended purpose or if the risk has become too large to continue.”
- “Hire Project Managers who are experienced in working with and capable of managing vendor progress against state contracted development goals. When resourcing PM’s to state agencies, ensure the agency assigns an administrator or executive level sponsor to work through issues and risks. PM’s should never report to functional managers in a state agency.”
- Create a single body focused on enterprise level IT projects. Call it a Project Management Office, Executive Committee or other name, but the bottom line is to have an established process of project intake, evaluation, prioritization (cost, impact, risk....), and scheduling of projects in order to properly plan for adequate resources.”



Another common area of advice involved understanding and building relationships with the key stakeholders who will be instrumental to the success of any critical IT initiative:

- “Work immediately to understand TCO and long-tail O&M issues surrounding the system, and gain champions for the project based on delivered benefits, as opposed to traditional cost-avoidance metrics. Develop a narrative and a story around the benefits of the system, and look to couch costs from the perspective of volume of service delivery (e.g., constituent benefit) as opposed to selling on the merits of “shiny” technology. But, don’t skimp on the technology aspect -- ensure that staff can truly evaluate proposals based on merit and enterprise fit, and not based on wanting to be “cutting edge.”
- “Have the executive support - that is the key. If you have to go into an agency and stop a project, you need that executive support. Also make sure that the business owner knows they OWN the system. All too often the business staff assume it is an IT project and don’t make the commitment.”
- “All efforts must be joint efforts between IT and business agencies. Do not start a solution without the buy-in and involvement of the affected agencies.”

- “Agency sponsorship should be prevalent and ongoing during the course of the project. In addition, clear expectations should be set in the beginning of the project. Use business or agency language to ensure all stakeholders have a clear understanding of project expectations.”
- “It’s all about controlling the money – how to use the mechanisms for appropriation to drive the right behaviors.”
- “No decision is ever based on logic.”



Sourcing

CIOs are increasingly encountering and adopting modern IT sourcing and service delivery models. The 2013 survey indicated that CIOs no longer feel that there are significant barriers to use of different sourcing and business models, and the 2014 survey data reflects an uptick in the use of novel arrangements. While control of the data center is characterized by heightened consolidation and CIO ownership, the infrastructure and applications provided by CIO organizations are increasingly procured from the private sector.

We asked CIOs about the business models and sourcing strategies they currently use within the organization. We asked this same question in 2010 and 2013, and those answers along with the 2014 responses are presented below.

While many aspects of the delivery of products and services have remains relatively stable, two areas have changed dramatically in the past four years:

- Consolidation of data centers has increased from 55% of respondents to 65%; and
- Outsourcing of some IT applications and services has grown at a strong pace - nearly doubling from 42% to 81% between 2010 and 2014.

Some respondents considered consolidation and outsourcing linked. As one CIO stated “You have to get consolidation done prior to doing any outsourcing.”

There was wide diversity among strategies in use across different states. Some states retain total in-house control of all infrastructure and services. Some other states are reassessing the role of the CIO function and stated “We should be in the business of providing IT services not in the infrastructure business,” and “I am a firm believer that in 5-7 years from now the states will be out of the infrastructure business – we will become brokers for services, rather than owning them.” Regardless of the strategies employed, respondents realized that “As our customer’s IT requirements evolve, the strategies for meeting those requirements must also evolve.”

Figure 15

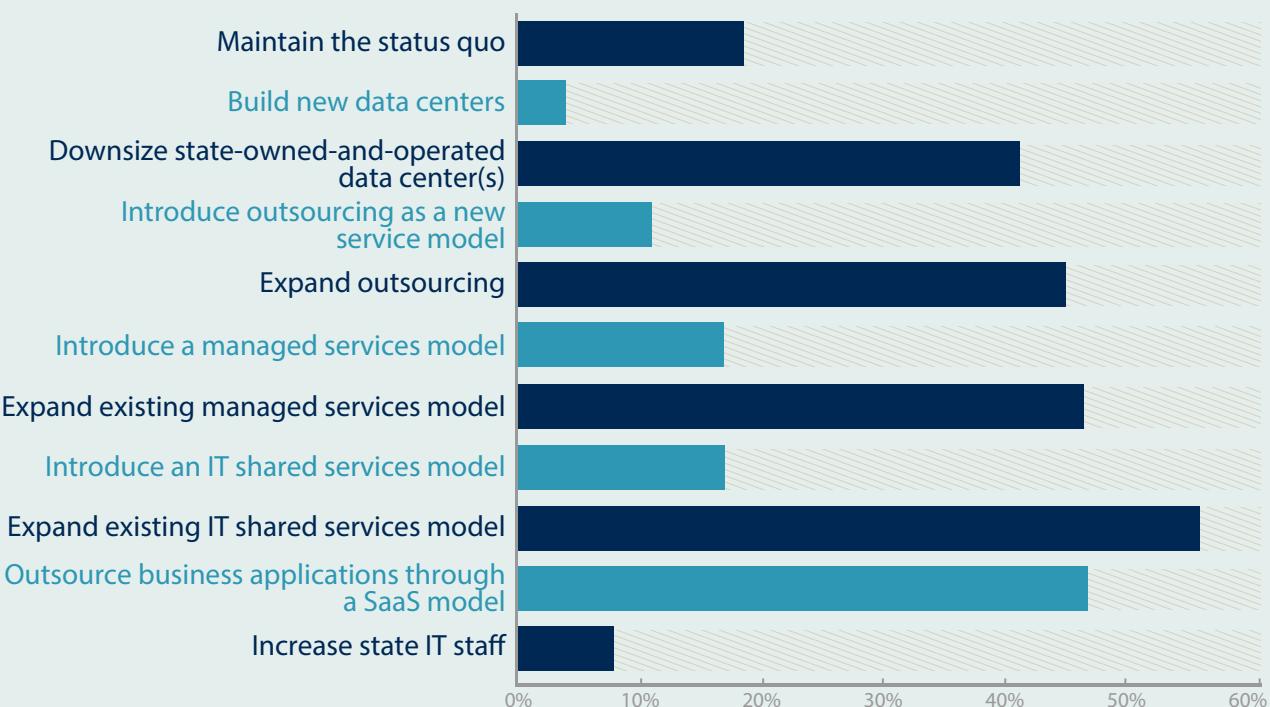
What business models and sourcing strategies does your state CIO organization currently use?	2010 Responses	2013 Responses	2014 Responses
Owes and operates all state IT assets and operations	32%	30%	37%
Owes and operates multiple data centers	58%	65%	58%
Owes and operates a consolidated data center	55%	57%	65%
Outsources some of its IT infrastructure operations	58%	51%	46%
Outsources some of its IT applications and services	42%	69%	81%
Uses a managed services model for some or all IT operations	50%	65%	60%
Uses an IT shared services model for some or all IT operations	66%	73%	70%



Figure 16



How does your state CIO organization plan to deliver or obtain IT services over the next three years?



Looking forward over a three-year planning horizon, major sourcing and service model imperatives for CIOs are led by expanding the portfolio of offerings built on a shared services model, downsizing the scale of state-owned IT assets - particularly in the data center, and increasing use of outsourced infrastructure and software-as-a-service applications.

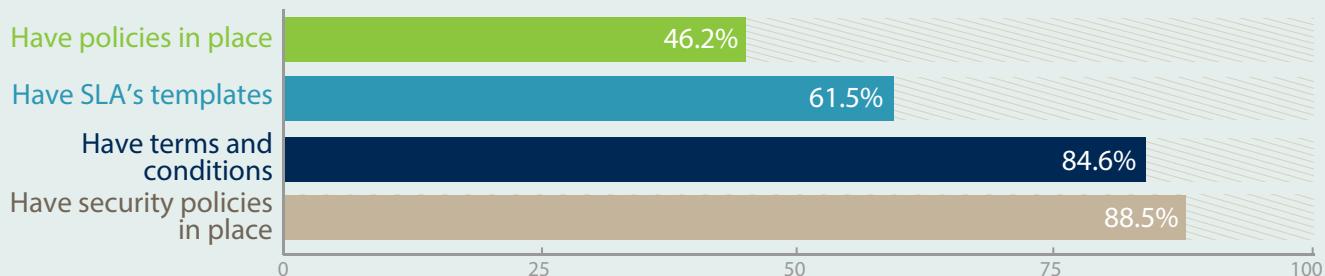
As the central IT organization moves to new models of service acquisition and delivery, CIOs envision their role as central to defining policy (in the areas of rules, standards and processes) and they indicate that their organizations are willing to take on responsibility for the procurement of managed services.



Figure 17



How well is your state positioned to move forward with a sourcing strategy that would focus on a managed services platform?



In assessing their ability to move forward with a sourcing strategy to implement managed services, most CIOs felt that they had the appropriate policies, including security in place, as well as the contractual Service Level Agreements and supporting terms and conditions. Surprisingly, none responded that they had any statutory prohibitions that would prevent them from implementing managed services.

To what extent do you believe that your procurement entity and processes used by your state are positioned to be effective in acquiring managed services?

On previous surveys procurement has been noted as a concern by state CIOs. However, in 2014 CIOs have displayed a “moderate” level of confidence in the ability of their state’s procurement entities and processes to effectively procure and contract for managed services. Those who have been most successful have either implemented procurement reforms, had their own in-house ability to procure or have instituted acquisition processes specifically for managed services. Lengthy procurement cycles still are considered problematic – a theme consistent with previous survey results.

Figure 18

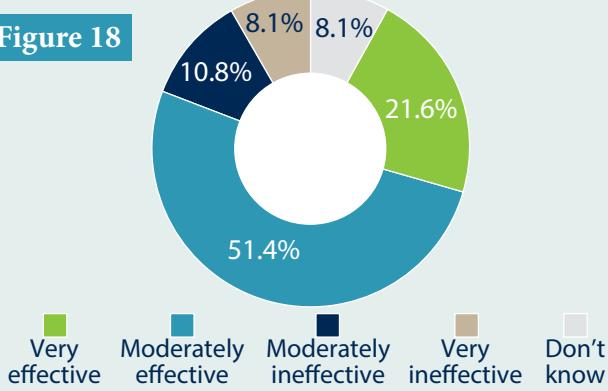




Figure 19



What areas are you contemplating to source for managed services in the next year?

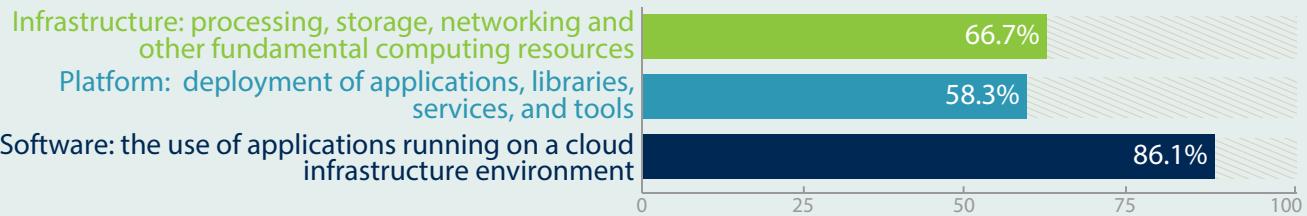


Figure 20

What sourcing strategies does your state CIO organization currently use in the acquisition of managed service providers?

Use an existing procurement vehicle not specifically designed for managed services	44.4%
Created a specific procurement vehicle for managed services	38.9%
Leveraged managed services procurement vehicles created by multi-jurisdictional consortia	55.6%
Leveraged managed services procurement vehicles created by the federal government	19.4%
Agreement(s) with other public sector entity	25%
Other	8.3%

When it comes to managed service procurement methods, the process itself seems to be distributed among using existing procurement vehicles not specifically designed for managed services, creating individual procurements, and leveraged agreements established by multi-jurisdictional consortia. Leveraged agreements are used by a small majority of states, and as other local governments move into implementing managed services it is probable this procurement method will continue to see more utilization.

As strategies, policies and procurement methods converge it's easy to see the growth in managed services continue trending upward. Once infrastructure processing, storage, networking and other fundamental computing resources have been established, deployment of applications and software will continue. As one CIO stated, "Nothing is beyond scrutiny... if it makes sense and is fiscally sound we will continue to research ways to more effectively deliver services."

Figure 21

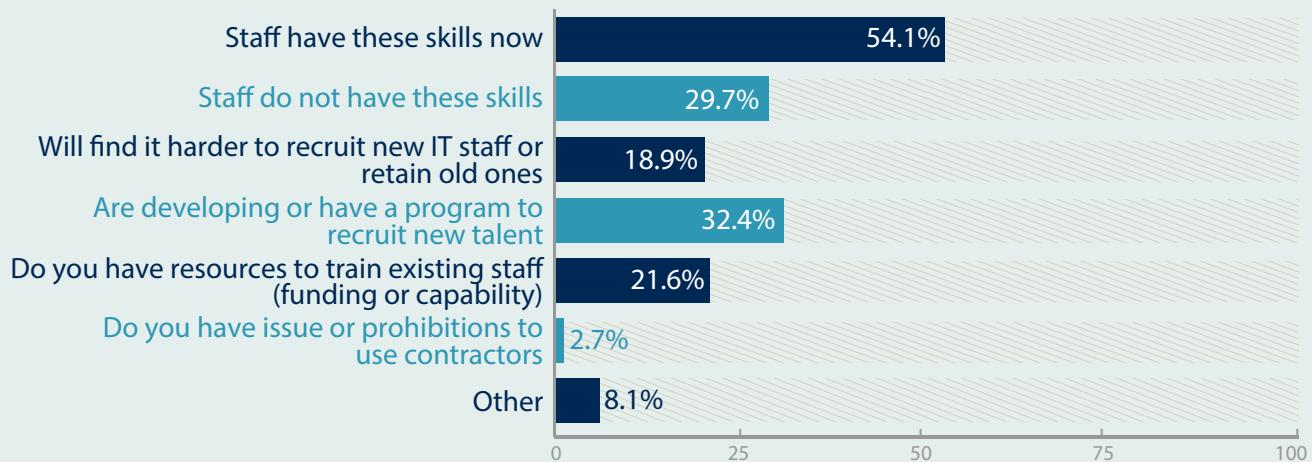
In deploying the above strategies, which of the following models will you use?

Private: Hosted by a single organization and made available to other government users	61.8%
Public: Hosted by public entity and openly available	38.2%
Community: used by a specific community of organizations with a shared purpose	35.3%
Hybrid: A composition of two or more of the above	79.4%

Figure 22



What impact would this new managed services model have on your organization and staff?



As most states have public and private data, CIOs must consider a wide range of customer needs in utilizing managed services. Having multiple agencies with similar needs creates economies of scale, and this can lower the cost of IT services delivered using a private model. The use of hybrid models will continue to grow as states mature in their use of managed services environments.

In an area that was expected to show great impact, CIOs responded that their organizations would have less of a problem transitioning to a managed services environment than first thought. CIOs responded that the impact of the use of managed services on their organization staff and resources could be managed. Some responded that their staff have the requisite skills for the transition and that training could be made available to their staff. However, there would still have to be a reliance on the contractors to train and transition activities. Also, there was an opportunity to transition state staff to other activities

that had more value. Where CIOs are experiencing challenges, they are often related to the customer relationship management (CRM) aspects of service delivery rather than the technical aspects. As some CIOs responded:

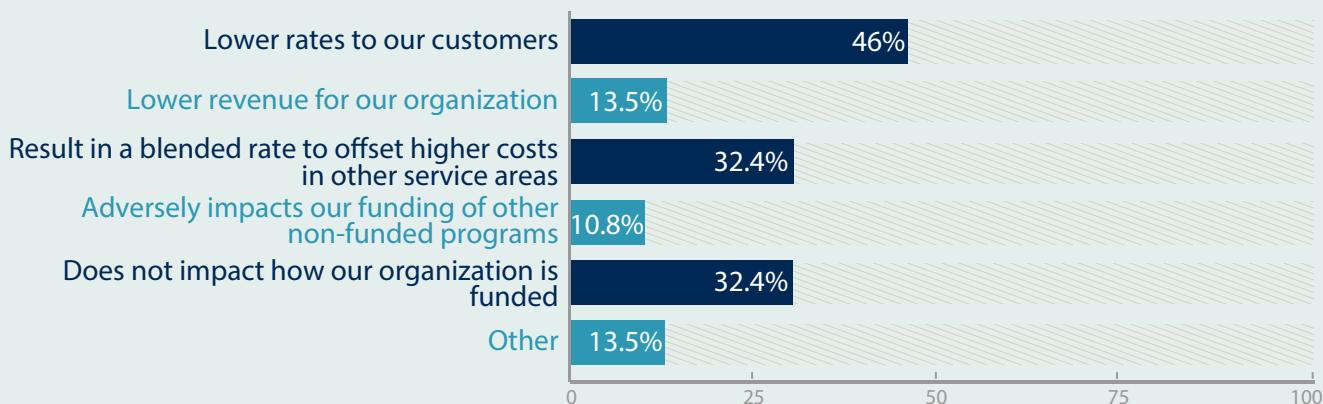
- “Internal sales for solutions is an issue – we don’t have business development/account management people.”
- “We have a CRM group (including some legislators) to help sell services.”
- “We want to make sure IT is a value-added service – the more people in ‘boxes and wires’ the less value.”



Figure 23



What impact would this have on your financial or fiscal CIO chargeback model?



Another focus of the survey that elicited a positive response was in the area of customer “chargeback” which has been the fiscal life blood for many IT organizations. The state CIO business model is complex, however typically involves charges billed to agencies for services outlined in a service catalog. The CIO survey responses showed that in many cases the use of managed services would not result in a significant lowering of revenue to the IT organization and could result in a lower overall rate to government customers. Cloud was considered an area that would impact the cost of services. As some CIOs stated:

- “The move to cloud will drive costs down, but it would be even cheaper with more consolidation of various data centers to better leverage existing capital assets”
- “Cloud will impact the chargeback mechanisms. Do customers pay the CIO organization or do they pay the SaaS vendor directly. What value is added?”



Managing Data as a Strategic Asset

For the first time in this survey series, we polled state CIOs in a comprehensive manner on the topic of enterprise data management. State agencies and CIOs are wrestling with the challenges of data governance, opening legacy system data to wider access, using data in new ways to support program performance and service delivery, and simultaneously managing major new flows of data from new sources. The growth of unstructured data has added more complexity to this discussion.

In this section, the survey questions capture the CIOs assessment of state data management, governance structures, current roles, and future plans. The questions also tap into a subset of enterprise data – business intelligence and analytics. Lastly, these lines of inquiry captured the CIO's assessment of information sharing/exchange in their states and the prevalence of “open data” portal use in the states.

The findings reveal states differing widely in their data management approaches and capabilities.

- The majority of CIOs (54%) report an increasing level of professional discipline around management of state data assets. An additional 10% report having a formal data governance structure, roles and responsibilities, and tools.
- Enterprise data management presents a more fragmented picture, as states programs and practices range from comprehensive and fairly mature to narrowly-focused and immature.
- CIOs see a proliferation of possible roles and responsibilities for their organizations – with the largest numbers focused on taking the lead in advocating for data as a strategic asset (80.4%) and on the need to develop an enterprise data strategy (86.3%).

Figure 24

How would you characterize your data management function in terms of importance and maturity?	
We have a long way to go to develop an enterprise view of data and governance of that data as a state asset	26.9%
We have made some progress in developing operating discipline for managing data	53.9%
We have a formal data management discipline that includes governance, roles and responsibilities, and tools	9.6%
We have formal data management discipline that includes governance, roles and responsibilities, and tools. We are now moving toward data as an enterprise asset	9.6%

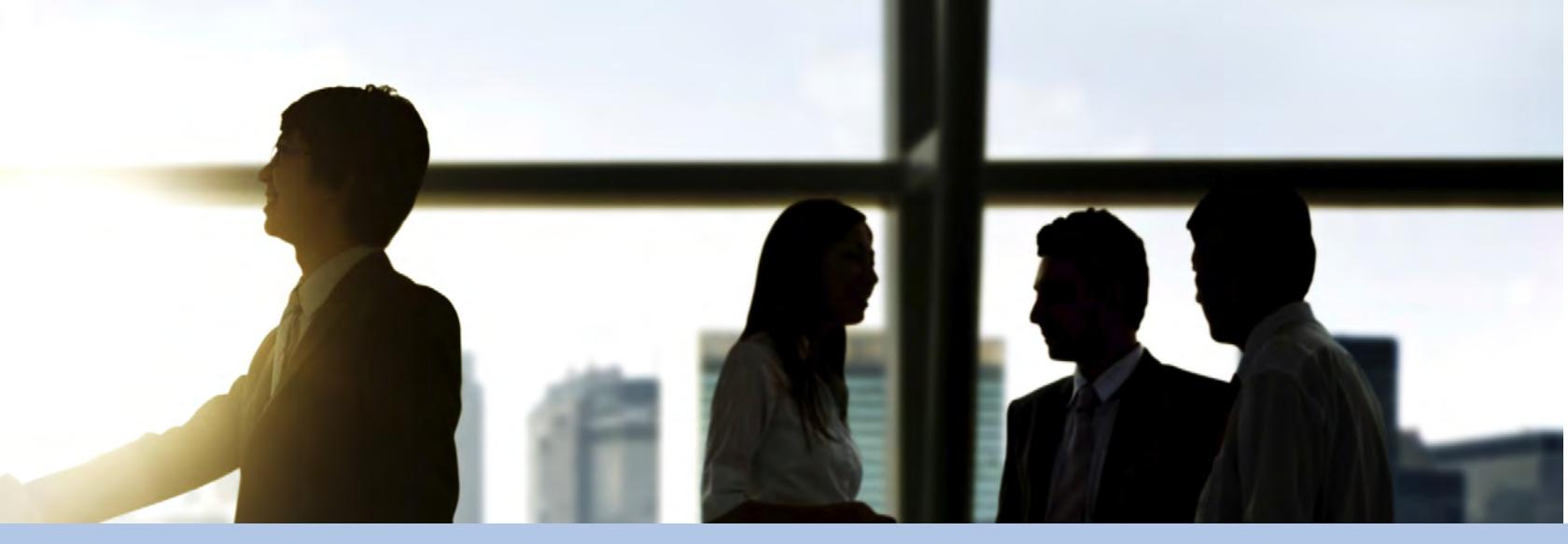
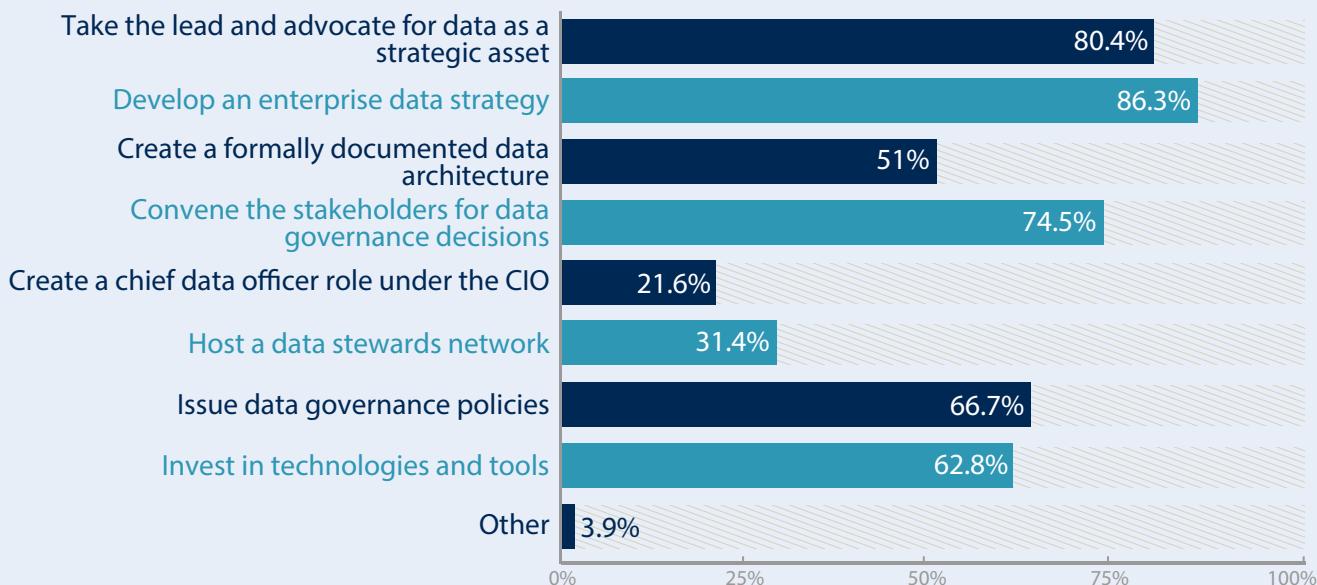


Figure 25



What is the appropriate role of the State CIO organization in enterprise data management?



Business Intelligence/Analytics

We have asked CIOs several times in past surveys about their states' use of Business Intelligence (BI) and Business Analytics (BA). Overall the trend shows a slow but steady

increase in the investment in BI/BA, but strong adoption and capabilities is still relatively rare.

Figure 26

From the enterprise perspective, what is the current utilization and deployment of BI/BA and data analytics within your state government?

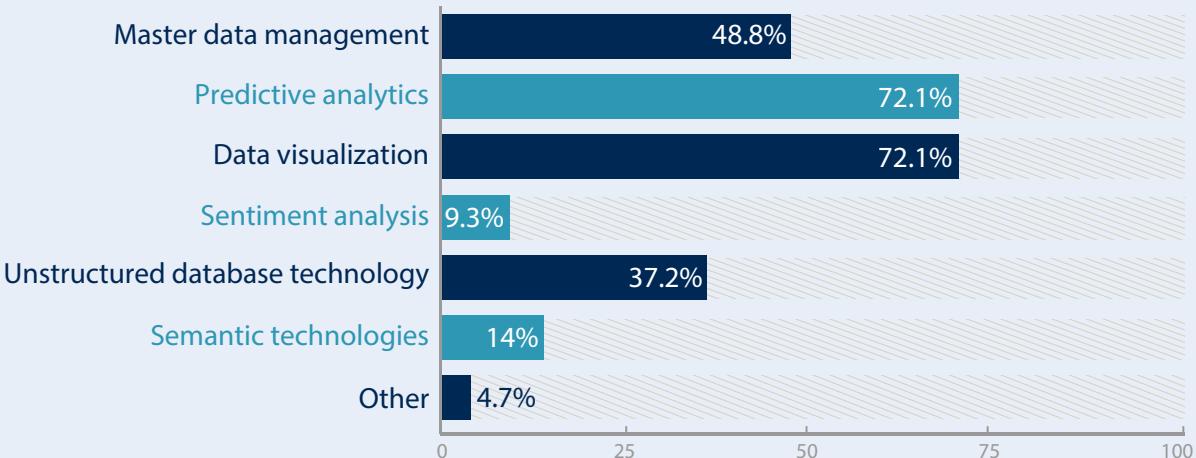
	2011	2013	2014
State is already highly invested and has substantial capabilities	12%	10%	16%
State has some capabilities in certain agencies	54%	65%	69%
State is still investigating solutions	22%	15%	8%
State has no investment	12%	6%	8%



Figure 27



What emerging data management solutions are used in your state today?



The sheer volume of data requires states consider emerging data management solutions to analyze and simplify the flow. CIOs that are advocating and supporting such technology implementations in these areas report high levels of activity in predictive analytics (72%) and data visualization (72%).

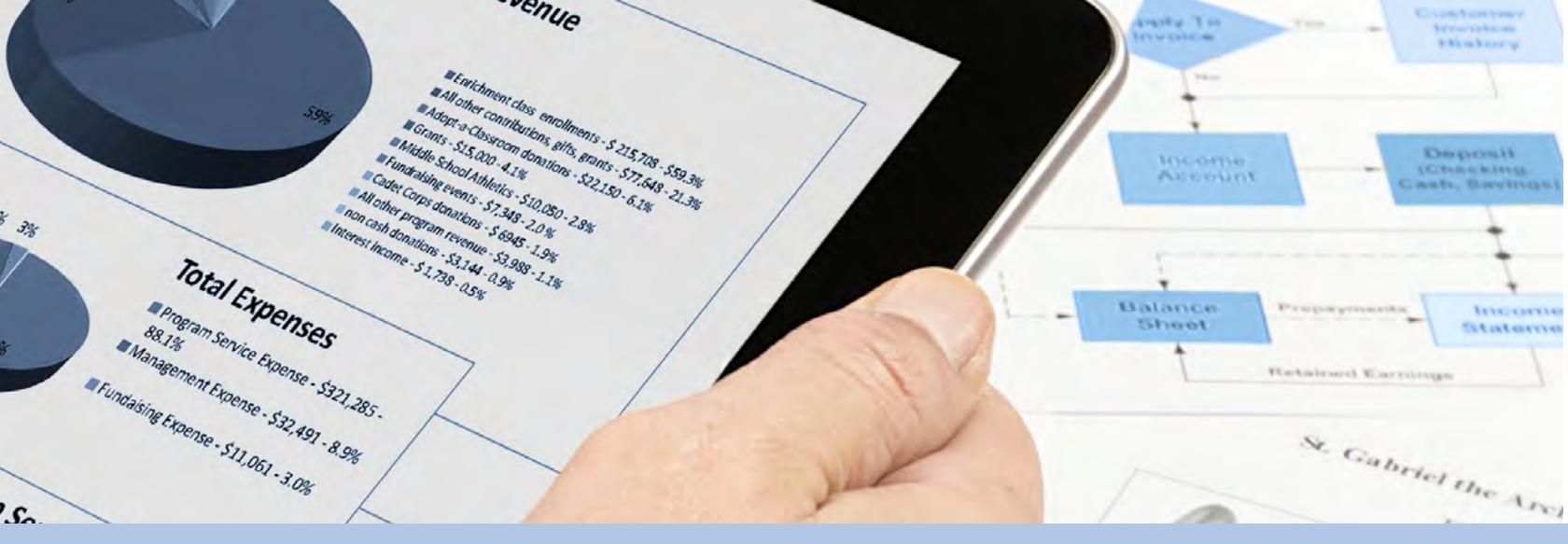
With regard to “big data” most states and CIOs are still firmly in the pre-evaluation or evaluation phases, but actual big data projects are becoming more common. We asked CIOs about their big data plans in 2012 and at that stage states were just beginning to consider big data in their strategic planning process. At that time only 35% of states addressed big data in their strategic plans and big data-related projects were rare. We now see that 34% of states have moved forward with big data related initiatives. Clearly big data is starting to arrive as a capability that states are employing, however it’s not clear if all the attributes of an authentic true big data initiative are present – volume, velocity, variety, complexity and variability.

We can anticipate that states will grow their ability to collect and analyze big data. We’ll keep an eye toward what actual outcomes are achieved as this capability matures across states.

Figure 28

How would you describe the status of Big Data in your state?

The state is still investigating opportunities for big data	41.2%
Big data underway project in one agency	7.8%
Big data project underway involving multiple agencies	13.7%
Several big data projects underway	11.8%
No activity at this time	21.6%
Don't know	3.9%



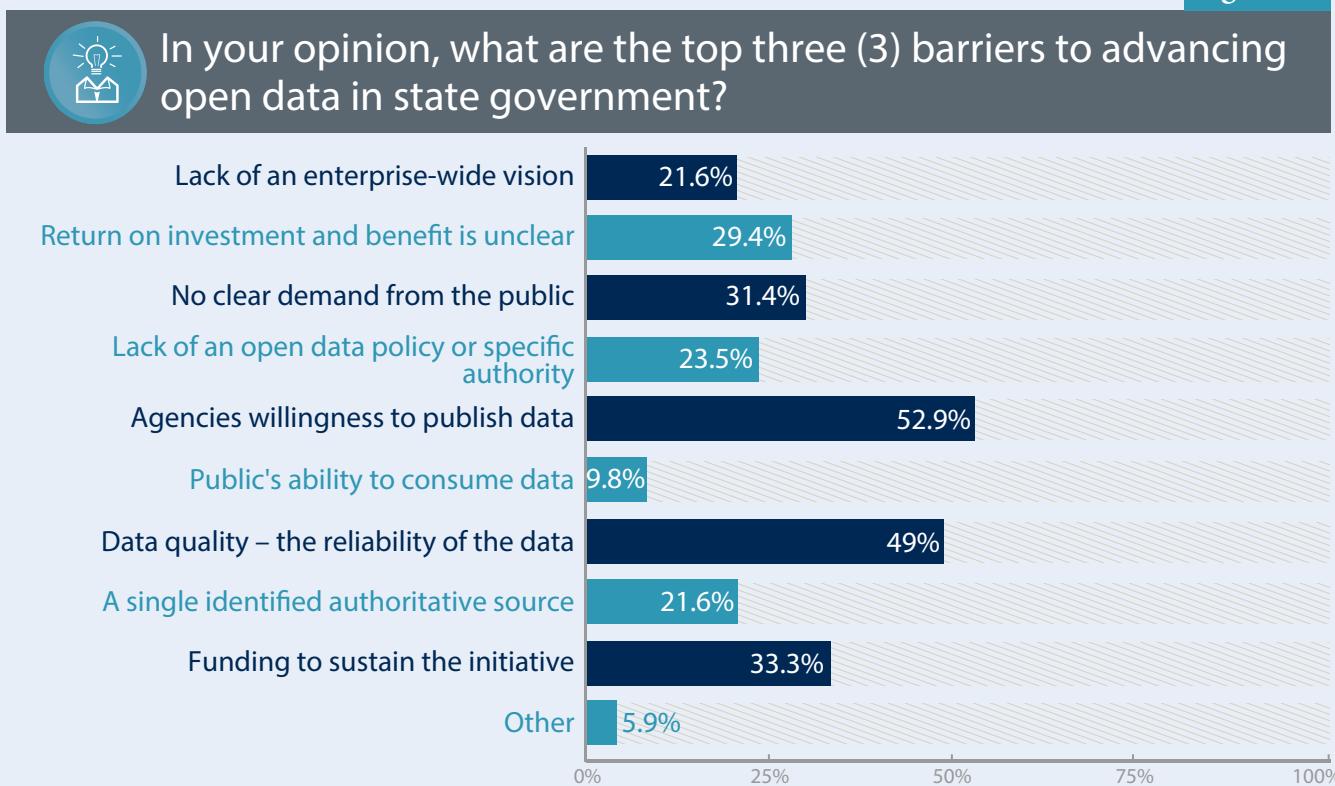
To close out our enterprise data management segment, the survey included questions on one of the important foundational elements of an enterprise data approach – information sharing – and posed a couple of questions on the emergent “open data” practices and tools.

Regarding the progress of state agencies toward full-fledged information sharing, respondents reported that agencies remain in the early phases of adoption – with a total 68% of states characterized as either “fairly protective and risk averse” (32%) or falling in the category of “beginning to make headway, agencies are seeing the value” (36%).

Open data practices and tools have become more common. Governors and other state leaders are advocating for “open government,” so states are pursuing

open data and supporting it with legislative authority. A surprising 48% of respondents indicate that their state is up-and-running with an open data portal. Those who see impediments to further information-sharing via data portals cite agencies unwillingness to publish data as the primary roadblock. Transparency and communication were seen by CIOs as a tool to encourage involvement in open data initiatives. As one CIO stated “We’re creating forums to communicate with agency CIOs and hear their concerns – this level of transparency is helping to overcome concerns over participation.”

Figure 29





Consolidation

As we have done in previous surveys, we asked CIOs for a status report on their efforts to consolidate state technology infrastructure and applications. Figure 30 shows this year's results compared to the data from 2013. Because respondents can change from year to year and because the infrastructure potentially subject to consolidation also could change, it is difficult to make direct comparisons across years. However,

it does appear that completion of infrastructure efforts has materially increased in a number of areas, most notably e-mail, security, and infrastructure-related areas such as data centers, servers and storage. With the exception of data center, email and telcom however, consolidation efforts are still not complete in even fifty percent of the states.

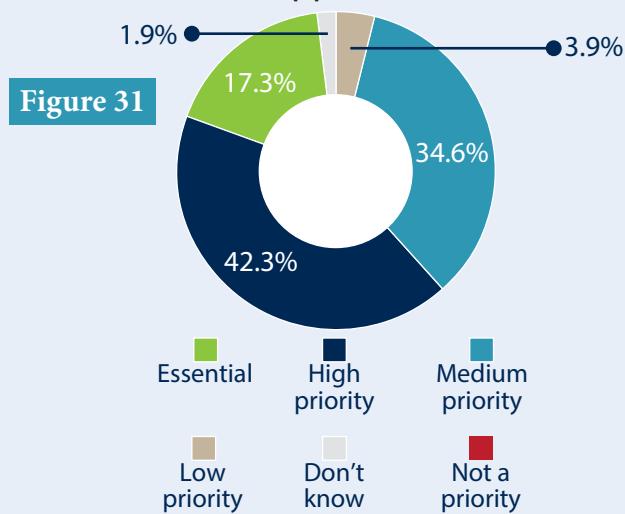
Figure 30

	2014				2013			
	Done	Ongoing	Planned	DK/DNA	Done	Ongoing	Planned	DK/DNA
Backup/disaster recovery	39.2%	47.1%	11.8%	2.0%	28%	59%	14%	4%
Business applications	16.7%	39.6%	12.5%	31.3%	19%	48%	19%	21%
Content management	18.0%	30.0%	26.0%	26.0%	15%	45%	26%	17%
Data centers	51.9%	40.4%	3.8%	3.8%	31%	60%	17%	2%
Desktop support	32.7%	30.6%	8.2%	28.6%	29%	31%	25%	20%
E-mail	65.4%	26.9%	7.7%	0.0%	53%	37%	10%	6%
Imaging	15.7%	35.3%	9.8%	39.2%	6%	40%	21%	35%
Security	44.2%	44.2%	5.8%	5.8%	32%	50%	20%	6%
Servers	43.1%	47.1%	3.9%	5.9%	30%	63%	16%	4%
Staff	32.7%	28.6%	4.1%	34.7%	38%	30%	23%	15%
Storage	41.2%	43.1%	3.9%	11.8%	30%	54%	18%	4%
Telcom	67.3%	26.9%	3.8%	1.9%	56%	39%	12%	4%

Mobility

We asked CIOs where mobile devices and applications fell within their plans, and it is clear that mobile continued to be a high priority for a majority of CIOs. We also asked CIOs about the manner in which their state government was managing mobility.

Within the state CIO's strategic agenda and IT operational plans, how would you characterize mobile devices and applications?



Interestingly, there has been a dramatic increase in the number of CIOs stating that all mobility projects are well-coordinated government-wide, while the number of CIOs stating that their projects are totally fragmented has also increased. Several respondents noted that mobility is now an explicit element of their State IT strategic plans.

Figure 32

How is your state managing mobility?	2014	2013
Totally fragmented and uncoordinated	18%	10%
A few coordinated government-wide projects and initiatives, but mostly fragmented efforts	31%	49%
About half of mobility projects coordinated, half uncoordinated	16%	0%
Mostly coordinated government-wide projects and initiatives, a few fragmented efforts	29%	37%
All mobility projects well-coordinated government-wide	6%	0%
Don't know/does not apply	0%	4%



Cloud Services

As we did in 2013, we asked CIOs about their state's level of investment in cloud services. Figure 33 below shows a continuing steady growth in the adoption and investment in cloud-based services.

Figure 33

What is your state's status regarding cloud services?	2014	2013
The state is already highly invested in cloud Services	20%	6%
The state has some applications in the cloud and is considering others	73%	68%
The state is still investigating cloud Services	6%	22%
The state has already considered cloud Services and rejected it	0%	2%
Don't know/does not apply (DK/DNA)	0%	2%
Other	2%	0%

We also asked CIOs for an update on which types of services they were moving into the cloud. We last asked this question in 2012, and as Figure 34 below shows, in most categories responses remain similar. The areas where CIOs appear to have revised their plans are office productivity software – where interest has significantly increased – and GIS and program/business applications – where interest seems to have decreased.

Figure 34

What categories of services have you migrated or do you plan to migrate to the cloud?	2014	2012
E-mail and collaboration	63%	64%
Storage	47%	48%
Geographic Information Systems	37%	48%
Disaster recovery	37%	44%
Program/business applications (e.g., licensing, unemployment insurance, workers' compensation, etc.)	29%	42%
Office productivity software (e.g., word processing)	47%	37%
Digital archives/electronic records	31%	31%
Citizen relationship management	33%	25%
Open data	28%	25%
Enterprise Resource Planning	28%	23%
Imaging	18%	15%
Other	22%	15%

Public Safety Broadband

We asked CIOs to characterize the role of the Office of the CIO in the state planning for the interoperable nationwide public safety broadband network and interaction with the First Responders Network Authority (FirstNet). We also asked this question in 2012, soon after the federal legislation was enacted. Figure 35 presents the responses from both surveys. It appears that more CIOs

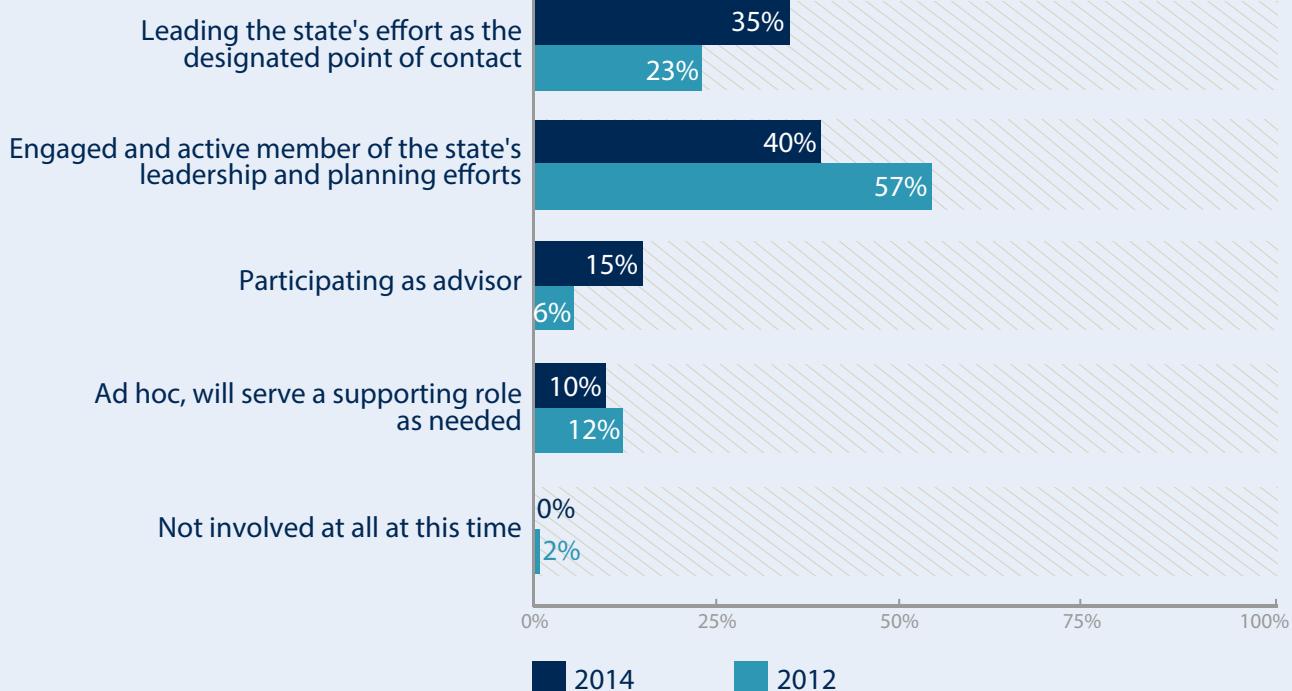


have taken on a leadership role in this area over the past two years, and that over one third of the states have the state CIO as the designated FirstNet point of contact.

Figure 35



Characterize the CIO's role in FirstNet



Cybersecurity

Cybersecurity remains a top priority and critical issue for state CIOs and one that continues to receive special attention from governors, other elected officials and the media. Highly publicized cybersecurity attacks and data breaches in the past twelve months have only served to enhance the visibility of this topic. We asked CIOs about their cybersecurity program and compared their responses to those they provided in last year's survey. As the figure below shows, overall status is relatively unchanged from last year. The relative lack of progress in key indicators underscores the significant challenges faced by CIOs to mature an enterprise imperative.

We also asked CIOs to update us on the most significant barriers they faced in addressing cybersecurity. The top four barriers are as follows and are entirely consistent with responses to the 2013 survey:

- Increasing sophistication of threats
- Lack of adequate funding
- Emerging technologies
- Inadequate availability of security professionals

Figure 36

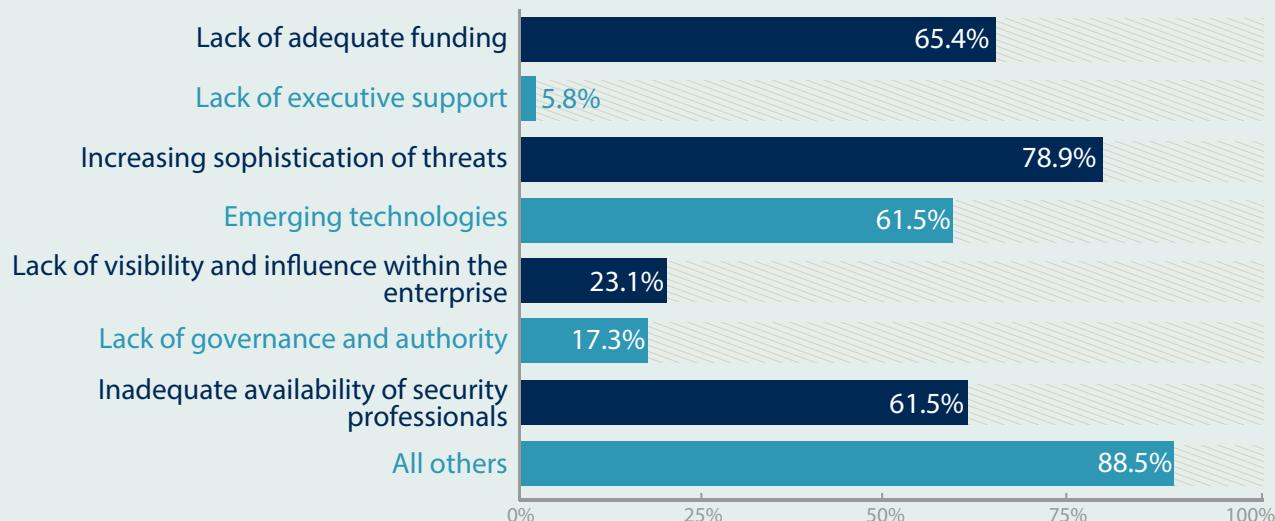
Characterize the current status of the cybersecurity program and environment in state government.	2014	2013
Adopted a cybersecurity framework based on national standards and guidelines	80%	78%
Acquired and implemented continuous vulnerability monitoring capabilities	78%	78%
Developed security awareness training for workers and contractors	80%	78%
Established trusted partnerships for information sharing and response	69%	75%
Created a culture of information security in your state government	75%	73%
Adopted a cybersecurity strategic plan	61%	61%
Documented the effectiveness of your cybersecurity program with metrics and testing	45%	47%
Developed a cybersecurity disruption response plan	51%	45%
Other	0%	6%

As one CIO put it “Cybersecurity is an inconvenience to most agencies and departments. Clients understand locking one’s house or one’s car. They don’t understand nor want to put the effort into understanding what is required to lock one’s digital assets.”

Figure 37



What major barriers does your state face in addressing cybersecurity?



Drones



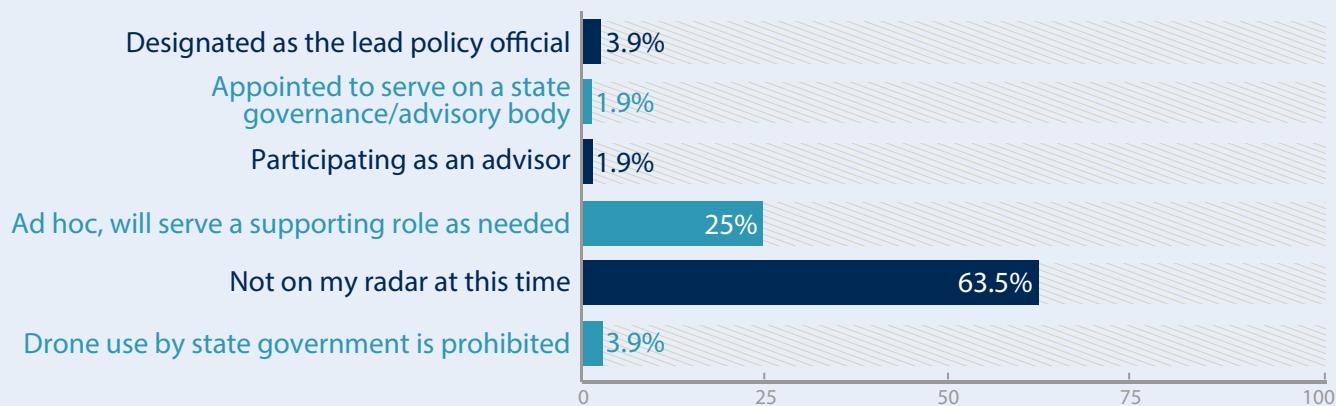
The use of civilian drones in US airspace has recently become a topic of intense interest, with concepts for commercial and law enforcement uses proliferating. Their use in state governments is also growing, as well as legislative debate on the merits. States must address the data management, security, privacy and safety policy issues related to drone use. We asked CIOs about their roles with respect to their state's use of drones. As the responses clearly show a large

majority of CIOs do not have a role regarding drone use in their states, although one quarter of CIOs do have an advisory role and a small fraction have been designated as the lead policy official in their state.

Figure 38



The use of domestic aircraft vehicle systems (UAS) or “drones” in state government is growing. Data management, security, privacy and safety are all policy issues that must be addressed. Characterize the CIO's role with respect to your state government's use of drones.





Conclusion

Forces of change continue to impact the state IT environment . Critical projects grow larger and more complex, the delivery of services involves an ever more complex supply chain, and data assets are more unstructured and distributed more widely than ever.

CIOs continue to have to adapt to these new circumstances. This includes the increasing use of third party providers delivering services that were once traditionally in the domain of their state's IT workforce. In addition, as managed services solutions become more prevalent, they must deal with the pressure to leverage and to protect the information generated by state governments, and to integrate this information across traditional organizational boundaries.

The CIO is increasingly a broker of services - they must coordinate the activities of multiple disparate entities, many of them commercial organizations with their own drivers and objectives. In the absence of extra resources and facing challenges in staff retention and training, innovation continues to be an important weapon in the CIO arsenal. We asked CIOs whether innovation was expected of them. Over two-thirds of CIOs stated that innovation was a critical part of their role. This reinforces a consistent message we have received from CIOs over the past several years – new ideas and new approaches are critical to adapting to changing circumstances and to charting the course of state IT in uncertain times.

List of states and territories participating in the survey

State of Alabama

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State of Alaska

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Director and Chief Information Officer

State of Arizona

Aaron V. Sandeen
Deputy Director and State Chief Information Officer

State of Arkansas

Claire Bailey
Director and Chief Technology Officer

State of California

Carlos Ramos
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State of Colorado

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State of Delaware

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Flint Waters
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Acknowledgements

We thank state CIOs for participating in this year's survey – the response rate was extraordinary. We also acknowledge the support and contributions of the sponsoring organizations and the time and expertise of the individuals listed below.

To obtain copies of this report and the survey questionnaires, go to any of the websites listed below.

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