

**READY FOR PRIME TIME?**

# State Governments Tune in to Artificial Intelligence



**AI  
AND MACHINE  
LEARNING**

Since the Industrial Revolution, mechanization, mass production and automation have changed the way we work and live. Today we are facing a new disruption and opportunity with the advancement of artificial intelligence (AI) and machine learning. Artificial intelligence is the development and ability of machines to perform human-like activities such as visual recognition, speech recognition, problem-solving and decision making. AI computer programs are controlled by humans and, at this time, are “specialists” good at one thing. Machine learning is a branch of AI and refers to machines that can analyze data, recognize patterns and make decisions independent of human interference.

For states the promise of automating tedious tasks, reducing paper work, turning over simple jobs, and analyzing large-scale data to gain a better understanding of society holds great promise – and some fear. While AI enthusiasts point out that computers will help humans do their jobs more efficiently and smarter, others fear an irreversible decline in available human jobs, greater vulnerability to cyber-attacks and the end to privacy as we know it. State governments are using AI in a variety of ways, and the possibilities for the future are endless and uncertain.

In the [2017 NASCIO State CIO Survey](#), we asked state CIOs “What emerging IT area will be most impactful

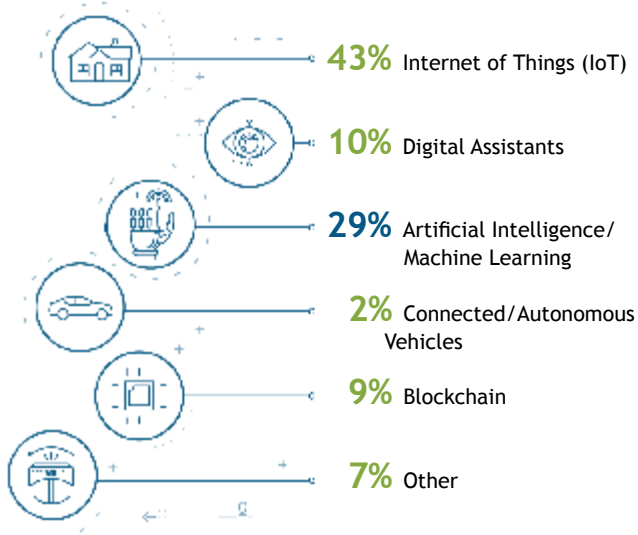
in the next 3-5 years?” While the top answer was “Internet of Things” with 43%, “Artificial Intelligence / Machine Learning” came in second with 29% of the responses. As CIOs have continued to seek improved citizen services with improved response time and accuracy “Artificial Intelligence / Machine Learning” moved to the top of the list in 2018.

Despite this trend do government employees think that impact will be beneficial or harmful? In the [Route Fifty 2018 Management Survey](#) of public sector managers, 65% of respondents agreed with the statement “New technologies are having a transformative impact on the structure of my organization.” However, 76% of respondents disagreed with the statement, “People in my organization are worried that their jobs will be replaced by technology.” The majority of public sector employees seem to hold the view that technology will only improve their work, not replace it.

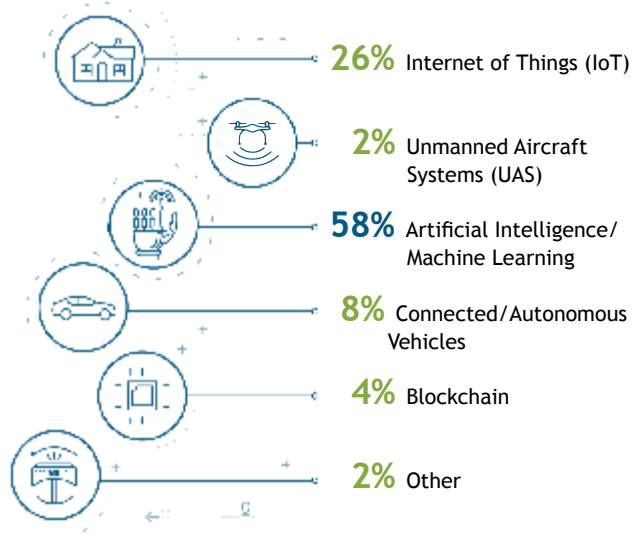
NASCIO will leave the job of predicting the future of AI (and whether it’s a threat to mankind as we know it, or the key to a utopian society) to other groups. Instead we will look at the current applications of AI in government as well as some possibilities. As government IT leaders and employees look to AI to change the work they do, let’s look at how states can and are using this kind of technology.

### What emerging IT area will be most impactful in the next 3-5 years?

#### 2017



#### 2018



## TYPES OF AUTOMATION IN AI

A recent Deloitte report breaks down the types of automation that are useful in the government context into four: relieve, split up, replace and augment. AI that *relieves* uses automation to take over more day-to-day tasks, freeing up workers' time to do more complicated things. This could help government agencies reduce backlogs to more quickly serve citizen needs. Using AI to *split up* tasks allows computers to do some of the work and humans to do some of the work (or supervise the computers). One example of this is using chatbots to answer simple questions while using humans to answer more complicated inquiries. Using AI to *replace* allows computers to do a complete job that was once done by humans such as reading zip codes. Using technology to *augment* our work uses technology to make humans more efficient or better at their jobs. An example may be using AI to analyze large amounts of data so that governments can see a clearer picture of a problem and implement policies to improve it.<sup>1</sup>

When considering the amount of paperwork state governments have, the idea of using AI to cut down workforce time and *relieve* humans of this work makes sense. There are technologies that focus on back office AI that can recognize handwriting better than humans, analyze it and enter it into a data base system.<sup>2</sup> The private sector has been using Robotic Process Automation (RPA) for several years, and governments are starting to follow suit. Because RPA is a software solution and can be used across multiple legacy systems, the cost benefit is enormous. RPA is especially useful in government customer service functions. Due to high accuracy, speed and standardization, RPA can save between 40-70% on labor costs, and near zero-error rates with both back office and front office functions.<sup>3</sup>

The Colorado Child Welfare Workload Study in 2014 found that case workers were spending 37.5% of their time on documentation and administration but only 9% on contact with families and children. The Colorado Department of Human Services made changes by hiring additional staff and providing case workers with

Types of automation that are useful in the government context:

- RELIEVE
- SPLIT UP
- REPLACE
- AUGMENT

mobile tablets so that they could do administrative work during downtime away from the office in courthouses and hospitals. However, if they had the opportunity to automate some of this work with AI, even more time could be spent on human to human interactions.<sup>4</sup>

The North Carolina Innovation Center has started looking into chat bots to *split up* some of the help desk work. Given that 80-90% of the help desk ticket requests are password resets, something a chat bot could handle, there is promise of vast time savings.<sup>5</sup> The State of Mississippi has a chatbot (aptly named Missi) that can respond to over 100 inquiries including “Where can I search for unclaimed property?” and “How do I renew my fishing license?”<sup>6</sup>

State governments are finding a solution to the long hours required for document discovery with the help of AI in eDiscovery. Computers can sift through documents in a fraction of the time it would take a human thereby *replacing* some of the human work for this job. According to an ongoing survey by Deloitte regarding eDiscovery for government agencies, attorneys feel increasingly confident about discussing matters related to eDiscovery with opposing counsel. On the flip side of the equation, today's technology is creating vast amounts of data, which is the top challenge to eDiscovery according to survey respondents.<sup>7</sup>

## OTHER APPLICATIONS OF AI

The Minnesota Pollution Control Agency is using artificial intelligence and analytics to import real-time weather information, crunch the numbers and then develop a basic analysis. Then the three meteorologists at the agency can review and revise the analysis. This allows vulnerable populations to get weather alerts quickly and allows the agency to develop forecasts and alerts for areas outside major metropolitan areas without additional staff. This is a good example of how AI can *augment* a job done by humans.<sup>8</sup>

State transportation agencies are finding useful ways to use AI. Maryland has announced a \$50 million upgrade to their aging traffic signals. The new traffic signals will be able to respond to traffic flow and conditions immediately, reducing travel times by 10-15 percent.<sup>9</sup> Vermont is also using AI for several projects including modeling for pavement to predict with 85% accuracy how long a road treatment will last, predicting bridge deterioration using various models looking at over 100 different factors, and for asset management identifying sign locations to prepare for the use of autonomous vehicles.<sup>10</sup>

Using AI and machine learning to assist states with cybersecurity needs is an incredibly helpful application for this technology. According to the [2016 Deloitte-NASCIO Cybersecurity Study](#), State Chief Information Security Officers (CISOs) continue to identify inadequate availability of cybersecurity talent as a top barrier. The ability to attract and retain cybersecurity professionals is impacted by pay grade structures as well as by competition from the federal government and the private sector. Because state CISOs often struggle to find qualified security staff at the state level, they may find that turning to artificial intelligence and machine learning is one solution while applying [advanced cyber analytics](#). As the amount of stored data grows, and available qualified workforce fails to keep up with demand, AI security software can detect threat patterns and allow the professionals to deal with most needed human-led tasks. Software that includes machine learning may be able to automatically respond to the continued sophistication of attacks and learn new patterns.<sup>11</sup>

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### Top three human resources factors that negatively impact the CISO's ability to develop, support, and maintain cybersecurity workforce:



96%

State's salary rates and pay grade structures



59%

Lack of qualified candidates due to demand from federal agencies and private sector



47%

Workforce leaving for private sector

State CISOs continue to identify inadequate availability of cybersecurity talent as a top barrier. The ability to attract and retain cybersecurity professionals is impacted by pay grade structures as well as by competition from the federal government and the private sector.

Source: 2016 Deloitte-NASCIO Cybersecurity Study.

## DIGITAL ASSISTANTS

“Alexa, renew my driver’s license.” While Amazon’s “Alexa” may not be able to do that just yet, states who are using Amazon “Alexa” applications for citizens think that could be the next step. Both Mississippi and Utah have been using Amazon Echo’s “Alexa” to help answer citizens questions.

Mississippi citizens with an Amazon Echo and a MyMS account can ask “Alexa” questions such as when a driver’s, hunting or fishing license expires and how to renew it as well as contact information for different departments. They can also ask for random facts about Mississippi.<sup>12</sup> Most recently Mississippi added traffic alerts within a 20-mile radius.

Utah is also using “Alexa” skills for Amazon Echo including a sample driver’s license test which has been popular with students studying for their driver’s license. Echo owners can also find out where Utah’s fishing hot spots are around the state in 150 different lakes and rivers. Citizens who are looking to get more involved in civics can ask about any public meetings in a specific zip code or location. Both states are focusing on Amazon Echo for now, as “Alexa” is still leading the market for at home digital assistants.<sup>13</sup>

## PLANNING, DEVELOPING AND DEPLOYING ARTIFICIAL INTELLIGENCE

It’s easy to see the possibilities for using AI in state government. But how do you get started? In a recent paper published by the IBM Center for the Business of Government, Keven Desouza points out that just like traditional information systems, “organizations must think through the business case, manage the project carefully, and ensure that metrics are in place to track performance and outcomes so that refinements can be made over time.”

In planning for AI, an organization must define a problem (not just look for one so that they can use AI) and express how the new systems will create efficiencies and innovations. Then the organization must show the data and opportunities that make AI a viable solution. Finally, key performance indicators must be identified so that the systems and the impact on the organization can be properly evaluated.

When developing an AI system, an organization must focus on creating ways to collect, combine and

prepare data to feed into a system. The systems also must be trained—learning from incorrect assumptions or conclusions. The organization must also decide what level of accuracy is important for the specific job. A chatbot with 80% accuracy could be great, or devastating depending on the type of agency it is serving (think IT help desk vs. medical help).

When deploying a new system, there are increasing levels of autonomy for the system. At first humans will regularly monitor performance and output. Then the system may run on an autopilot function, where humans still work with the system or can override it. Finally, a system can run autonomously while still interacting with humans or even other systems. Humans would still need to monitor the system and evaluate the need for any needed upgrades, and step in when necessary.<sup>14</sup>

## AI BY DESIGN: THOUGHTFUL IMPLEMENTATION

With all the promise and possibility of AI, it's easy to want to jump in head-first and get started. However, in a recent paper published by the Ash Center for Democratic Governance and Innovation at the Harvard Kennedy School, author Hila Mehr lays out “six strategies that can help governments start off on the right foot with AI: make AI a part of a goals-based, citizen-centric program; get citizen input; build upon existing resources; be data-prepared and tread carefully with privacy; mitigate ethical risks and avoid AI decision making; and, augment employees, do not replace them.”<sup>15</sup>

Making AI part of a goals-based, citizen-centric program means using AI as a tool only if it's the best way to solve a problem—not forcing it just because the technology is available. It's also necessary to think of a citizen's entire customer journey and the different ways they will interact with government and what other touchpoints might be necessary (human or other technology). In keeping the citizen in mind, it's also vital to ensure the technology is inclusive of generational, educational, income and language differences.

States should build upon existing resources and not feel that they must start from the beginning to make a new product. The availability of current products,

research and open-source machine intelligence programs means that states need not spend extra money and time creating a new product if something is already available.

Agencies need to consider how well their data management processes are implemented and organized before diving into AI. There will be a need to use collected and aggregated data for AI. Citizens must be aware of the type of data that is being collected. There needs to be a certain level of transparency, as well as the ability to opt-in to data sharing for any new data collected.

To avoid ethical issues, agencies need to be aware of bias in AI. Care should be taken when programming or training AI and ensuring that inputs are not corrupted. It helps to involve a diverse group of stakeholders as well as ethicists in AI efforts. Human oversight should remain a requirement.

And finally, state governments should use AI to augment human work, and not replace it. It should be used as an opportunity to improve the work that people are doing in government, and possibly to free-up time so that workers can be more creative in their jobs.<sup>16</sup>

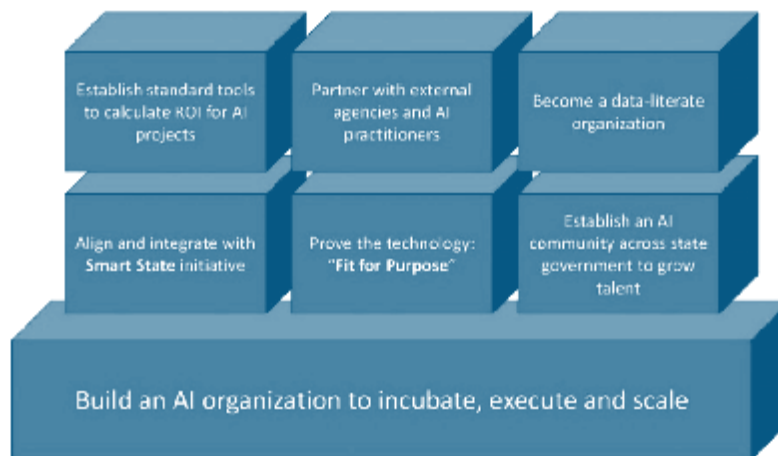
## IMPLICATIONS FOR STATE CIOs

CIOs should be prepared to talk about disruption to the workforce and use their role as change managers to think ahead to how these technologies will alter, change, disrupt or eliminate the work that people do on a daily basis. With some forward thinking and planning these changes can occur more smoothly.

As with many projects in the CIOs office, developing a roadmap can mean the difference between an ad-hoc approach to AI deployment full of unexpected problems, and a well-designed project. The State of

Illinois Department of Innovation and Technology has designed an AI roadmap for this reason.

CIOs also should be involved in the procurement process for AI and RPA technologies to insure they are appropriate for the enterprise, fit within the roadmap and conform to security and privacy requirements. To get the ball rolling on AI, a CIOs office may choose to fund and run pilot projects for the state. This may help in getting agencies on board to try new technologies and get buy in from other stakeholders in the state.



## THE BUILDING BLOCKS OF AI FOR THE STATE OF *ILLINOIS*

The state of Illinois is developing an AI roadmap for implementation across agencies.

Source: State of Illinois Department of Innovation and Technology

## THE FUTURE OF AI IN GOVERNMENT

It's impossible to know exactly where artificial intelligence will take our state governments in the next five, ten or twenty years. NASCIO sees AI as an emerging issue and one that will certainly change the way governments do business and the way citizens interact with government agencies and state-run services.

AI will likely make things more efficient: traffic flow, bureaucratic processes, and public communications. AI will also likely be the tool needed to make use of the vast amounts of data that states are collecting at increasing rates. The sheer amount of data makes it impossible for humans alone to analyze the

information and find patterns. AI will be the key to using data to improve operations, change policies and improve lives.

AI will also change the way we work. Organizations will look for different qualities in employees as humans and machines split up the work they do, and humans take on different roles. Some jobs will no longer be done by humans. Some new jobs will be created.

One thing is clear: artificial intelligence isn't just about the future. It's here and it's happening. States should be prepared to take on the challenges and opportunities that AI has to offer today.

## ENDNOTES

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