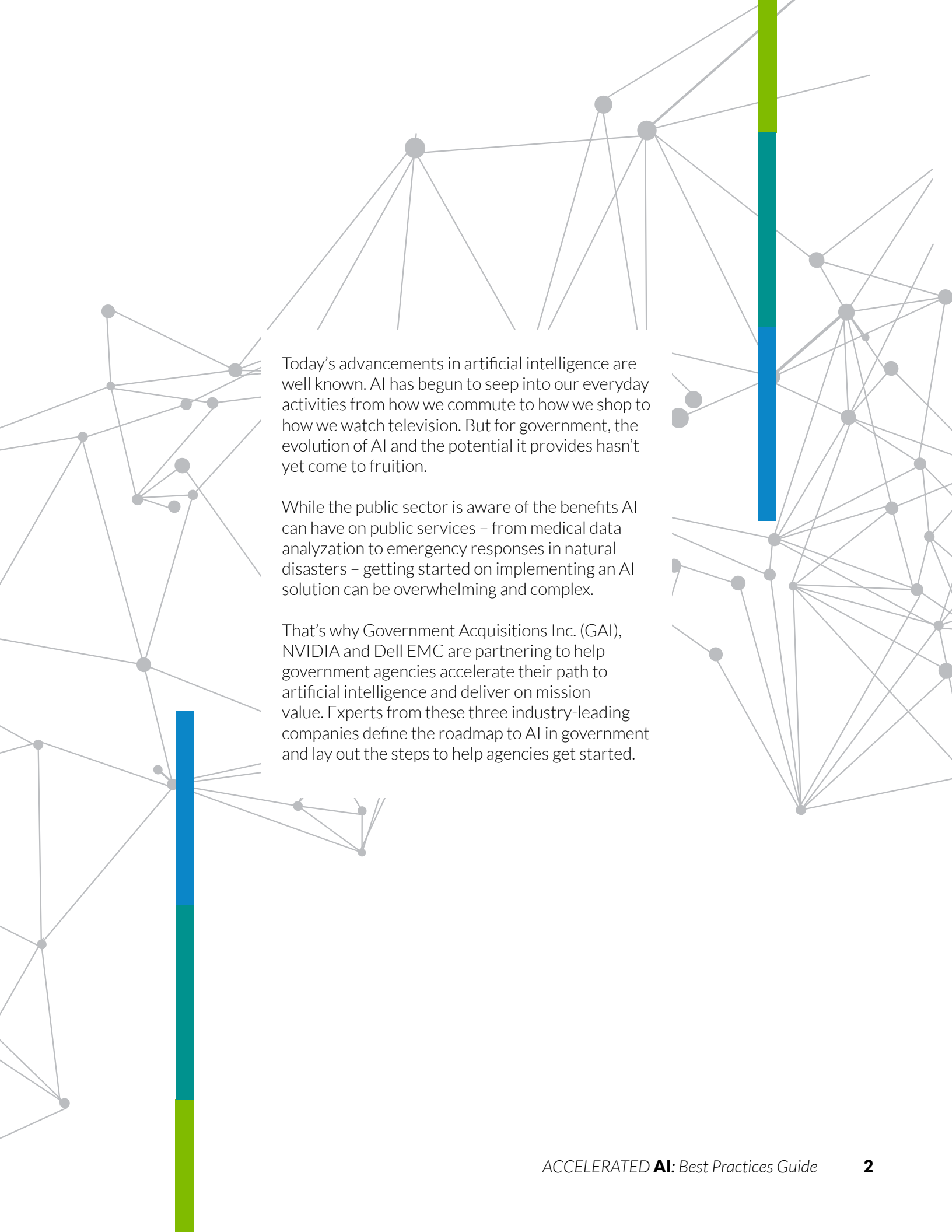


A background network diagram consisting of grey nodes connected by thin grey lines, forming a complex web of connections.

# *ACCELERATED* **AI**

**Best Practices for Implementing  
AI in Government Agencies**



Today's advancements in artificial intelligence are well known. AI has begun to seep into our everyday activities from how we commute to how we shop to how we watch television. But for government, the evolution of AI and the potential it provides hasn't yet come to fruition.

While the public sector is aware of the benefits AI can have on public services – from medical data analyzation to emergency responses in natural disasters – getting started on implementing an AI solution can be overwhelming and complex.

That's why Government Acquisitions Inc. (GAI), NVIDIA and Dell EMC are partnering to help government agencies accelerate their path to artificial intelligence and deliver on mission value. Experts from these three industry-leading companies define the roadmap to AI in government and lay out the steps to help agencies get started.

For AI to achieve its full potential, organizations need to think about their data and access rights differently. “We have a long history helping our customers capture data, manage data, organize data,” says Jay Boisseau, high-performance computing and AI technology strategist at Dell EMC. “Now, one of our critical roles is to help customers understand how to harvest more potential out of that data with AI.”

Boisseau recommends following a three-step discovery process for data management and uses. This helps agencies better understand their data and see where AI might be applicable:

- *Research and interviews.* Understand the mission, use cases and potential AI and ML applications.
- *Data exploration.* “This is where we work with you to see what your data sources look like and do some simple data science exploration to determine what you can get done and the potential impact we can have,” Boisseau says.
- *Ideation workshop.* “This is a collaborative process in which stakeholders from across the customer agency

come together with us, review findings and mockups and identify the use cases with the best odds of success.”

Once agencies have a handle on their data, Boisseau recommends a few points of guidance that can drive success as they embark on AI programs:

## 1. Learn from others.

**The best way to ramp up your learning curve is to leverage those who have already been there and done that.**

Workshops and learning companies like Dell EMC and its partners, e.g. NVIDIA and GAI, combine expertise in hardware, software and systems integration efforts to understand the federal sector, and can help focus teams’ understanding and motivate activity.

## 2. Identify opportunities.

“Start small,” Boisseau says. “You don’t have to convert everything in your agency to an AI-powered process at once. Pick some low-hanging fruit, and let your team develop local expertise.”

## 3. Don’t give up.

Not all problems are right for AI, and some trials won’t prove fruitful, Boisseau says. “Maybe there’s not enough data, or the data is not in a useful form.” If that’s the case, learn and move on.

## 4. Measure everything.

“Get some early success in a measurable way, so that you can show a return on your investment. Then you can build on that success.”

## 5. Stay alert.

The AI market is dynamic, and the only constant is change. “In the near term and moving forward, you are going to continue to have a rapid grow-out cycle. The faster you can get up to speed on what’s possible now, the better positioned you will be to leverage new products and solutions as they emerge.”

The biggest hurdle government agencies face today in trying to operationalize AI is fear: fear of failure, fear of not understanding how to make progress, fear of not having the right expertise and talent in place, even fear of missing out – that the private sector will have AI totally figured out long before the federal government can come up to speed.

Marc Hamilton, vice president for solution architecture and engineering at NVIDIA, laid out a plan for how agencies can get started and minimize risk:

## 1. Don't be intimidated.

"It absolutely isn't true that you need to have people with PhDs in AI working for your organizations to get started," Hamilton says. "Really, what an agency has to do is learn how to use these new classes of tools."

Practitioners do not have to learn a programming language or become adept and agile

programmers. Rather, they need to learn to use framework products like TensorFlow from Google, Microsoft's Cognitive Toolkit or PyTorch in the Open Source community.

"It's not that you're creating new fundamental PhD research," he adds. "You're using all the research that's been done over the last several decades on AI, then you're applying your domain expertise to your problem set, by means of one of those tools."

## In other words, you can do this.

## 2. Go to school.

You don't need to go to a university and start hiring data science PhDs right out of school. But you should think about bringing at least a few people up to speed on the technology and

the art of the possible.

The Deep Learning Institute founded by NVIDIA provides a series of short workshops that provide the kind of hands-on training that developers, data scientists, and researchers are looking for to build the basic understanding needed to get started.

Through self-paced, online labs and instructor-led workshops, the Deep Learning Institute teaches the latest techniques for designing, training, and deploying neural networks.

"After just a one-day class, users come out having developed a very simple deep neural network, giving them the basic skills and confidence that they can take the next step," Hamilton says. "We don't explain all the PhD level math of what's going on behind the scenes, but you will learn enough that you can go back to your organization and start making connections about where AI could help."

### 3. Think broadly.

“AI isn’t just for image recognition,” Hamilton says. Its uses are as broad as the data sets you touch. “Remember, data is just zeros and ones. Just about everything can be reduced to zeros and ones. It’s pictures, it’s sound, it’s voice, it’s Internet of Things data, it’s structured, it’s unstructured.” Datasets can also be combined. The greatest insights will come not from analyzing a single dataset in isolation, but in analyzing multiple datasets in aggregate.

Indeed, there’s a risk your data has value you don’t understand. “People say, ‘Well, I have a little 50-cent sensor, and I can track the data it produces on my own - I don’t really need AI for that,’” Hamilton says. But that may miss the point. You may have a thousand of those sensors, and the sum total of the information they collect could be highly telling as deep learning looks for patterns across the datasets.

### 4. You’re not alone.

There’s little to stop anyone from buying some cloud compute and storage capacity and starting to experiment. But there’s a big leap from little experiments to full-scale solutions.

Before committing large sums to major hardware or cloud purchases, it pays to partner with others who have deep experience with this technology and the expertise to help your agency succeed.

Dell EMC and NVIDIA, for example, have a High-Performance Computing and AI Innovation Lab with more than 1,000 servers built to demonstrate AI solutions in a realistic computing environment. “It’s an amazing proof-of-concept center, fully equipped with not only the latest Dell servers and NVIDIA GPUs, but with high-speed storage, and staffed by Dell and NVIDIA AI experts who are there to help others develop viable and valuable proofs of concept,” Hamilton says.

### 5. Experiment.

Start small – you don’t have to hit a home run your first time out. Instead, invest a little to learn a lot, Hamilton says. “You don’t need to get to 99 percent accuracy to prove a concept is worthwhile. So, you don’t have to have 300,000 data samples before you can move ahead.” By starting with a fraction of that, you can demonstrate and prove your concept with a smaller investment in time, effort and technology. By doing so, you’ll be better prepared to make smart investments later.

For NVIDIA, that’s critical because the company’s focus right now is about helping customers understand what’s possible with today’s technology.

**“They’re going to learn how to do AI,” Hamilton says. “Our aim is to accelerate that process.”**

# Adopting AI: 7 best practices



For agencies that have found a use case or have pinpointed a pilot program for AI, Prem Jadhvani, chief technology officer at solutions provider GAI, provides some best practices for first steps.

Jadhvani offers these seven rules as guidance when adopting AI:

## 1. Start with something easy.

Adopting AI will save time and money in the long run, but in the near term, it will require a very steep investment. Achieving success on a small level builds confidence. For instance, in the field of cybersecurity, AI automated systems and algorithms can help identify and patch vulnerabilities and provide automated defense against advanced cyberattacks, where humans typically fail.

## 2. Focus on mechanical tasks first.

“Any task that requires a lot of repetitive work, has high

transaction volume and is rules-based and non-subjective, is a good candidate for Robotic Process Automation (RPA),” Jadhvani says.

Of course, there are other, more complex problems where AI could have greater potential. But starting with the basics will get you ready for more complex solutions later.

The most efficient solution would be to use RPA for automating human capital management or supply chain processes that integrates back-end, enterprise-level IT processes with front-end desktop tasks using a simple interface that is intuitive for system administrators and accountants alike. AI will not replace RPA, however RPA tools that use AI will end up replacing RPA tools that do not use AI.

## 3. Don't try to boil the ocean.

If your data set and the problem you're trying to solve is too big, you'll get nowhere.

Agencies achieve better, faster results when they drill down deep on a given use case, then iterate rapidly to improve results.

The real value lies in the aggregation of the data to test, refine, and re-test the AI engine, allowing it to perform increasingly sophisticated feats of supervised learning and unsupervised learning.

## 4. Don't get hung up on the hardware – or the software.

“Now, with the new advances in hardware and the new scalable neural network and deep learning algorithms that are evolving, instead of taking weeks or months to get results, you can crunch your data with GPUs and high-end memory and generate results in hours, if not minutes.

So, this is very, very disruptive,” Jadhvani says. AI is taking off because big data workload processing that used to be very time consuming can now be done in minutes. Deploying GPUs enables agencies to optimize

their data center infrastructure and gain power efficiency.

### **5. Cloud makes a difference.**

The cost of data storage is plunging at the same time as the volumes of data are exploding. If you have large data sets in a data lake, you're a good candidate for trying to wring savings from the numbers. "Today, I can store petabytes or even exabytes of data – at a very fractional cost. I don't have to buy all those storage devices anymore," says Jadhvani.

### **6. Modernize.**

"Technology is an enabler and AI is not magic," Jadhvani says. "If you are sitting on a lot of legacy technology, look for ways to modernize." With IT modernization comes the potential to automate processes that cannot be automated with legacy equipment – including solutions that may involve AI. Modernizing the infrastructure includes investing in next generation technologies such as Hybrid Cloud, High Performance Compute, Hyper Converged Infrastructure, Optimized Storage, GPU Accelerated

Purpose Built Appliances, High Speed Communication Networks, Geo Distributed Data Lakes, Virtualization & Containers, SDN, Blockchain, Object Storage as well as next-gen cybersecurity and privacy platforms.

### **7. Seek out mentors – and make them partners.**

"This is a journey, so don't just think, 'Oh, I'm going to use some deep learning AI algorithm and I will be successful.' It doesn't work that way," Jadhvani says. "You have to have a mentor, a solution provider who's going to guide you along the path to achieve the final outcome you want." Mentors should be more than sounding boards or advisors – they can also be valuable partners, guiding and helping you throughout the AI solution lifecycle – from inception to mission outcome. Think of that when choosing integrators or solutions providers; getting into AI is not like buying a computer, but more like adopting a new way of doing business. You'll get further faster if your partner has done that before.

**“With cloud and massive data processing power at my fingertips, I just use the data, run my algorithm, get my results, and when I’m done, I can delete or archive the data.”**



## The possibilities are endless – but government has to get started.

The potential for AI in government is limitless – from cyber to healthcare to humanitarian response. The next step is for agencies to understand and embrace the use cases and start testing. AI implementation is now more accessible than ever with the help of partners like GAI, NVIDIA, and Dell EMC. These industry leaders know AI will have a profound impact on government – not just in the way citizens and businesses interact with federal agencies, but also in how federal agencies enable our economy and national defense. Virtually every aspect of government stands to be transformed and improved with the benefit of artificial intelligence. AI has the ability to make our interactions with government better and make government’s work more effective.

To learn how to get started with AI, visit [here](#).