THE JOURNEY TO AI IN THE PUBLIC SECTOR

Dell EMC™ solutions and Intel® technologies accelerate the evolution of analytics and AI for public safety and security.

Data analytics and artificial intelligence (AI) have the potential to improve processes and results in a multitude of public-sector scenarios.[1] The motivations are often practical: to strip out the mundane, manual work that clogs up government operations. But in the areas of defense, public safety, and security, the stakes are higher, and it is here where some of the highest levels of public-sector AI innovation and adoption are occurring.

However, the adoption of AI in the public sector is generally happening at a much slower pace and on a smaller scale when compared to the private sector. According to one survey, about 20 percent of respondents in government are actively experimenting or have made investments in AI, compared to 50 percent among what Gartner calls "top performers" in other industries.[2]

> "A recent survey found that 77 percent of US Federal managers said their agencies will need to deploy AI over the next five years 'to keep up with the increasing pace of work'."
>
> — New Statesman[3]

Several factors are now converging that could accelerate public-sector implementation of cognitive technologies such as computer vision, natural language processing (NLP), and machine learning (ML). First is the explosion of data that both enables AI and demands it as a solution. Much of this new data—video and audio streams, for example—is of the unstructured kind well-suited to AI. Meanwhile, storage and compute costs have dropped significantly, making high-performance computing (HPC) more mainstream and creating opportunities for cost-constrained public agencies. Finally, new optimized frameworks and package solutions make the move to AI less daunting and more accessible.

AI in Public Safety and Security

Opportunities abound to take advantage of AI to improve public safety and security, from public health to emergency preparedness to crime fighting. Public health agencies use AI-enabled real-time tracking and reporting to identify vulnerable populations and track health problems. In one example, NLP was applied to social-media posts to identify likely sources of food poisoning and target those establishments for increased inspections, resulting in more citations and reduced food poisoning rates compared to random inspections.[4]

Another public health advance occurred when the US Centers for Disease Control and Prevention (CDC) streamlined its polio virus tracking and reporting process with an AI tool that classifies virus types and separates disease reports into related clusters.[5]

There are a number of opportunities to take advantage of AI in the area of emergency response. First, ML can be applied to better predict disasters caused by weather, fire, earthquake, or disease. Then advanced threat modeling and simulations can be used to build better emergency response and disaster-relief plans around logistics for evacuations, relief supplies, and medical response. Finally, emergency responders can use AI with image and data processing to pinpoint danger zones and more effectively target responses.
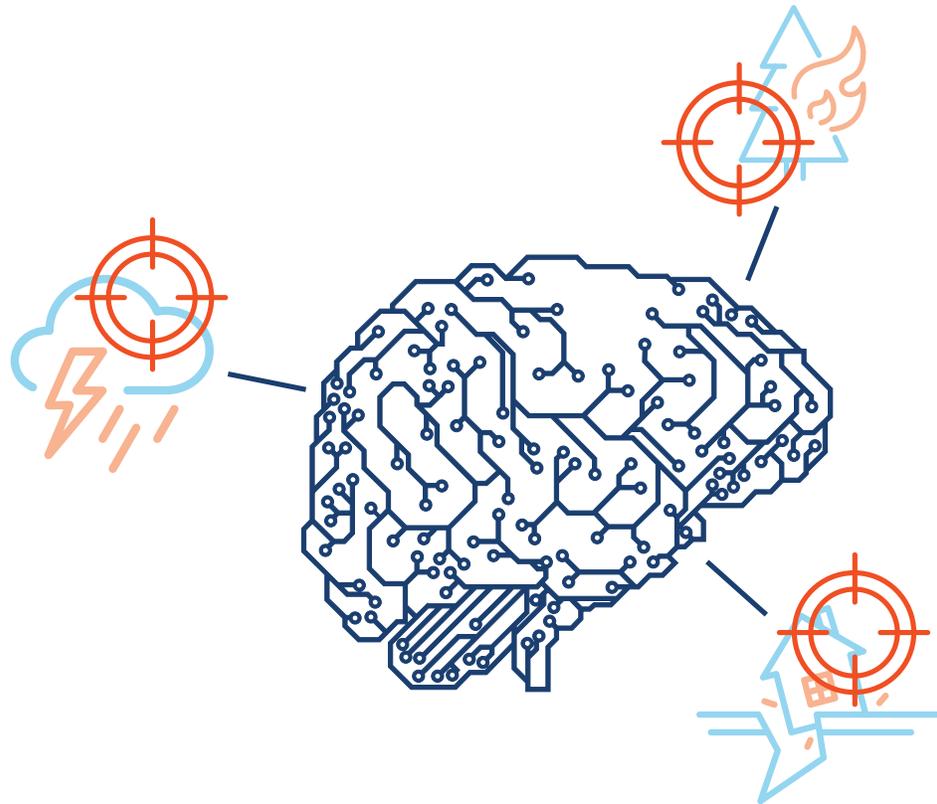
Airport security systems have started using AI in the form of facial recognition and behavioral analytics to protect against threats. In the Munich airport, for example, persons of interest are identified and followed selectively (such as with zooming and panning), while reducing the number and scope of people-watching cameras.[6]

The same kinds of AI-enhanced security used in airports could also be adopted in other highly populated and vulnerable venues. San José State University enhanced its security by deploying portable security units that include high-definition (HD) cameras, gunshot- and chemical-detection sensors, and built-in AI-assisted analytics.[7] Sports stadiums are also pursuing advanced security systems.[8]

AI is also being put to use in fighting crime—not just in urban areas with growing networks of cameras, but in the borderlands as well. The US Border Patrol uses satellite imaging and geospatial analytics to identify traffic patterns and optimize placement of Internet of things (IoT) sensor devices to better feed an AI computer vision system. This system automatically detects whether people have weapons, are hauling oversized backpacks or drug bundles, if children are present, or even if there are dangerous animals or endangered species in the area.[9]

"With this machine learning and AI capability, we have been able to transform a previously labor-intensive task that required us to inspect every visual, into a situation where we can now assess thousands of images a day."

— Assistant Chief Patrick Stewart, US Border Patrol[9]

Finally, AI is playing a growing role in cybersecurity in the public sector, just as it is in the private sector. From threat hunting to risk analysis, there are many opportunities to make use of AI. AI can learn characteristics of previously observed threats—such as malware and network intrusions—in order to identify potential new threats in real time. One of ML's greatest strengths is outlier detection, which is the backbone for user and entity behavior analytics (UEBA). UEBA determines whether an activity emanating from or being received by a given device is anomalous, thereby making it a natural fit for many major cybersecurity defensive activities.

Dell Technologies Offerings

Wherever you are on your journey toward AI, Dell has the products, solutions, Intel® technologies, and AI expertise to help you take the right next steps.

Start at the Edge

Many of the scenarios discussed above involve collecting data from cameras, microphones, and other sensors at the edge (that is, in the field), far from the data center. It's important to understand two things about data collection and ingestion:

- First, decisions you make at the edge can have significant impacts on your downstream data analytics. Choosing a resolution and framerate for video streams from cameras, for example, will tremendously impact the amount of storage and compute power required to analyze the video data.
- Second, AI is not a single goal achieved only at the far end of the data lifecycle. Analytics and AI in various forms can be implemented at the edge and all along the data lifecycle. In the case of campus security, for example, San José State University deployed V5 Systems portable security units, including Dell Edge Gateway servers. These units apply deep learning techniques to identify

the specific sound signature of a gunshot and triangulate the location from which it came by comparing data from multiple units.

If your AI project starts with data from IoT sensors or surveillance cameras, Dell has solutions for you in the field:

- **Dell Technologies IoT Solution for Surveillance** combines hardware and software optimized for surveillance needs, along with management and orchestration. The solution is pre-integrated, pre-tested, and lab-validated for use with your own data when combined with the appropriate device choices (such as cameras and sensors), software (such as analytics), and services.
- **Dell EMC PowerEdge™ XR2 rugged servers** with Intel® Xeon® Scalable processors are designed for harsh, space-constrained environments.
- Dell EMC PowerEdge servers with **Intel® Arria® 10 field-programmable gate arrays (FPGAs)** bring faster, more powerful computing to the edge.

Dell Technologies Handle the Biggest Military Projects

Military uses for big data analytics and AI are some of the most advanced in the public sector. AI can be embedded into weapons and surveillance systems to enhance performance. It can also be used to improve logistics, transportation, target recognition, battlefield healthcare, combat simulation, training, threat monitoring, and situational awareness.[10] Dell has the scale and expertise to take on the biggest projects. For example:

- Delivering hardened servers and storage, ruggedized and mobilized for nearly any environment, in an exclusive contract with Tracewell Systems[11]

- Helping the US Navy move its IT systems to the cloud, in addition to providing data center services on a $231 million contract[12]

- Helping the US Air Force move its IT and communications to the cloud on a $1 billion contract, along with Microsoft and defense contractor General Dynamics[13]

Accelerate Your Project with Dell EMC Ready Solutions

Dell EMC Ready Solutions include software, servers, networking, storage, and services optimized for HPC and AI workloads, including both traditional and cognitive data analytics. Whether it's a highly integrated turnkey solution or a flexible customized one, each Ready Solution is based on a scalable building block approach, so the infrastructure you buy today can grow to meet your needs in the future.

Beyond a complete portfolio of technologies included with each Ready Solution, Dell EMC also makes experts available to help create HPC configurations that can dramatically accelerate results in AI, ML, and deep learning (DL) environments. You can take a test drive with a proof of concept in one of the Dell Customer Solution Centers or in one of Dell EMC's worldwide HPC and AI Centers of Excellence.[14]

The following Ready Solutions are built on 2nd Generation Intel Xeon Scalable processors to support the most demanding applications:[15]

- **Dell EMC Ready Solutions for HPC** represent a flexible portfolio of high-performance technologies including customizable Intel Arria 10 GX FPGAs that combine to create custom end-to-end solutions matching your specific target workload and use case.
- **Dell EMC Ready Solutions for AI,** including ML with Apache™ Hadoop® and DL with Intel, combine software, servers, networking, storage, and services optimized for AI workloads.
- **Dell EMC Ready Solutions for Data Analytics** can help you unlock the value that exists within your data.
- **Dell EMC Reference Configurations for AI** are recommended configurations using Dell Precision™ workstations or servers for inference and training.

Taking the Next Steps Toward AI in the Public Sector

Different levels of government are at different stages in the project of developing AI-assisted solutions. National-level defense programs might be early adopters of advanced AI technology, whereas agencies at the state and local level are often still at the early stages of considering such projects. Dell EMC has the expertise and products, based on Intel technologies, to help agencies at every level of government proceed faster and with more confidence toward AI-assisted solutions, no matter where in that journey they might be.

Use what you already have to get started. Dell EMC can help you get the most from what you have and get started today with consulting, education, deployment, and support services. Expand existing data-analytics infrastructure with AI reference configurations for PowerEdge servers and Ready Solutions.

- Learn more about Dell EMC Ready Solutions for AI at **www.dellemc.com/readyforai**.
- Learn more about Dell EMC Ready Solutions for HPC at **www.dellemc.com/hpc**.
- Get in touch with worldwide Dell Technologies Customer Solution Centers at **www.dell.com/csc**.
- Visit the Dell EMC HPC and AI Innovation Lab at **www.dellemc.com/innovationlab**.

INTEL® AI BUILDERS MEMBER

Dell EMC is a member of the Intel® AI Builders Program, an ecosystem of industry leading independent software vendors (ISVs), system integrators (SIs), original equipment manufacturers (OEMs), and enterprise end users, which have a shared mission to accelerate the adoption of artificial intelligence across Intel® platforms.

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bail hearings, triage healthcare cases, and establish drone paths. Harvard Business Review. "How AI Could Help the Public Sector." January 2018.
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Interviews/in_Boardroom_Porter_DeLLEMC.html.

[7] Dell EMC. "Security Solutions: Leveraging IoT technologies to solve campus security and safety challenges." www.emc.com/collateral/solution-overview/campus-security-iot-solutions.pdf.

[8] Dell. "Protecting what matters to make the world safer." www.dellemc.com/en-us/solutions/surveillance-security.htm#scroll=off. Dell EMC is partnering with the National Center for Spectator Sports
Safety and Security to research technology architectures that improve venue safety and security.

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