The Next Phase of AI in Government

Artificial intelligence offers an unprecedented opportunity to solve complex public-sector challenges — and transform government and the country as a whole.

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Artificial Intelligence

Uncovering AI’s True Potential

The term “Artificial Intelligence” was coined in the 1950s, but the concepts behind it emerged centuries ago. In the modern era, though, it has long been the province of specially trained scientists and those with access to supercomputers.

AI is slowly becoming more mainstream thanks to advances in other technologies that provide the storage and computing capacity that AI requires. That progress is also due in no small part to the government’s growing ability to collect the vast amounts of data that AI systems need to function well.

For government, AI promises to streamline operations, facilitate decision-making and improve customer services in ways that weren’t possible before. Ultimately, it has the potential to transform the country’s security, prosperity and well-being.

Fine-tuning strategies and allocating money

Agencies have already begun using machine learning, robotic process automation, the internet of things and other AI tools to improve operations, but in many ways, AI’s potential is still untapped. In a recent survey of FCW readers, 72% said their agencies have not begun deploying AI-based tools, and 70% said their teams had no training in data science or AI.

Fortunately, numerous efforts to promote AI are underway across government. Perhaps most notably, the White House issued the Executive Order on Maintaining American Leadership in AI last year and announced the American AI Initiative, a national strategy “to sustain and enhance the scientific, technological and economic leadership position of the United States in AI R&D and deployment.”

That strategy is guided by five principles that address the need for technological breakthroughs on the part of government, industry and academia; technical standards and the removal of barriers to AI adoption; training for current and future American workers; protection of privacy and civil liberties to foster public trust in the technology; and an international environment that supports American AI research and innovation while protecting critical AI technologies from competitors and adversaries.

Several months later, the White House hosted the Summit on AI in Government to brainstorm ways that agencies can adopt the technology.

Other efforts include the establishment of an interagency Select Committee on AI under the National Science and Technology Council, an update to the National AI R&D...
Strategic Plan that identifies critical areas in need of federal funding, the National Institute of Standards and Technology’s (NIST) release of the U.S. Leadership in AI plan for developing technical standards, and the establishment of the National AI Institute at the Department of Veterans Affairs with the stated purpose of advancing the health and well-being of veterans.

In November, the National Security Commission on AI released its interim report to Congress, with its initial assessment of AI’s connection to national security, areas for improvement and preliminary steps the government could take. The report also notes the broad, bipartisan support the commission has received across the public and private sectors.

As a result of all those efforts, the government is starting to allocate more money to AI initiatives. The fiscal 2020 budget provides about $850 million to support the White House’s American AI Initiative at four agencies — Energy Department, National Institutes of Health, NIST and National Science Foundation. The Networking and IT Research and Development Program issued a supplement to the budget that added AI as a program component area for the first time and made a non-defense budget request of $973.5 million for AI.

Beyond automating rote tasks
Many early AI efforts have focused on implementing chatbots to save employees’ time and increase citizen engagement. The Agriculture Department is developing a chatbot to help USDA customers more easily find the information they need while freeing employees to concentrate on higher-level activities. State and local agencies are using chatbots to answer questions about government services such as license plate renewals and to report problems such as potholes.

AI’s capabilities extend far beyond answering users’ routine questions, of course. For instance, cities are adding sensors to traffic lights to better manage vehicles’ flow through congested areas — and thereby reduce traffic accidents, dangers to pedestrians and pollution. In addition, NASA’s Jet Propulsion Laboratory and the Department of Homeland Security collaborated on the Assistant for Understanding Data through Reasoning, Extraction and Synthesis (AUDREY) to provide situational awareness for first responders at the scene of an emergency.

In a press release, DHS officials said AUDREY is personalized to the individual responder and “leverages human intelligence and collects data to achieve better machine intelligence and provides insight that first responders may not have in the crucial moments of an emergency.”

At the Defense Department, officials have also recognized the power of AI. They created the Joint AI Center in 2018 to accelerate the technology’s adoption across DOD. Although AI is not yet ready to tackle complex activities such as nuclear command and control or missile defense, it eventually will be, said Lt. Gen. Jack Shanahan, the center’s director, in an article published on Defense.gov last October. “There is no part of the Department of Defense that cannot benefit from AI,” he added.

The Army is already using AI for predictive maintenance on its aging Bradley Fighting Vehicle fleet and successfully predicted failure on a major subsystem two weeks after the capability launched, which avoided downtime and improved soldier safety. Last September, the Air Force released an AI strategy to “harness and wield the most representative forms of AI across all mission-sets, to better enable outcomes with greater speed and accuracy, while optimizing the abilities of each and every airman,” officials wrote in a press release.

What’s more, AI is finding an expanding role in cybersecurity, with many agencies looking for commercial tools that can detect and respond to incidents on its networks without human intervention. Along the way, agencies also recognize that their employees need better training to deploy and manage AI tools. The Defense Acquisition University is one of them. Officials issued a request for information on solutions for an adaptive learning environment that responds to students in real time. In other words, it wants to use AI to teach 174,000 DOD acquisition professionals about AI.

As AI adoption grows, challenges related to transparency, explainability and privacy are emerging. Many experts are urging the U.S. government to take a leadership role in addressing those challenges and ensuring the ethical use of AI worldwide. The technology has come a long way in recent years, and the stage is now set for AI to improve government — and people’s lives — in previously unimaginable ways. ■
A R T I F I C I A L I N T E L L I G E N C E is the most transformative technology of our generation. We are at the forefront of the fourth industrial revolution, where intelligent machines will help humans with repetitive, mundane tasks, allowing people to focus on higher skilled, mission-critical job functions.

Technology companies, the early adopters of AI, have been aggressively investing in and deploying AI. And we are seeing this trend continue into the broader market. Gartner predicts that by next year, 70 percent of organizations will boost their employees’ productivity by integrating AI in the workplace.

But what does this mean for the public sector? Federal agencies need to move quickly to harness this game-changing technology. Some have already started — we’re seeing AI automate drug intake forms at the FDA, verify IT credentials at the Defense Department and automate financial transfers at the Treasury Department.

With the federal government being one of the largest collectors of data, AI has great potential for every agency.

**Start with automation**

According to a 2019 Ernst and Young report, about 93 percent of an HR employee’s work hours are spent on repetitive tasks, and about 65 percent of those tasks can be automated. Robotic process automation (RPA) can train machines to take on tedious and time-consuming tasks such as payroll, claims processing and benefits administration. Many companies and agencies are using RPA to reshape the modern workforce and liberate employees from repetitive tasks.

For example, the president’s fiscal 2020 and 2021 budget mentions 30 initiatives that are using RPA and AI to make agencies more efficient.

RPA can be simple to manage and needs only minor workforce reskilling. Sixty-six agencies including the General Services Administration and Air Force are already using RPA from UiPath, which has freed thousands of full-time equivalent employees to focus on higher-level work while reducing cost. UiPath offers agencies Task Mining, Task Capture and Process Mining to accelerate the design and build phases of the RPA process, making it easier to implement and scale automation.

UiPath harnesses the power of NVIDIA’s AI platform to accomplish mission and business processes. Getting started is as simple as downloading UiPath’s software application. UiPath AI Fabric helps agencies leverage the increasing presence of AI to ensure that their investment in RPA today is the down payment on their AI program tomorrow.

**Harnessing AI with NVIDIA GPUs**

Some agencies may want access to hardware to develop algorithms or analyze data on their own, and there are many ways to do...
With the federal government being one of the largest collectors of data, **AI has great potential** for every agency.

that without building or reconfiguring a data center. NVIDIA GPUs are available for deep learning training, inference and accelerated analytics from NVIDIA, OEMs and leading cloud service providers. For a full-stack AI system, leveraging GPUs and architecturally optimized for AI workloads, agencies can look to NVIDIA DGX Systems. Through NVIDIA DGX-Ready Data Center partners, agencies can de-risk their initiatives with a test drive approach that lets them kick the tires before they deploy. Additionally, the DGX-Ready Data Center program offers a network of colocation providers certified and ready to host DGX infrastructure, helping teams avoid capital budget spent on data center facilities.

In terms of deep learning training, there are many ways to get up to speed, including online courses from organizations like Coursera, edX, NVIDIA’s Deep Learning Institute and Udacity. Instructor-led training is also available from a number of data science bootcamps and places like GTC.

These are among a few examples of how government agencies and other organizations can harness AI to increase efficiency, ultimately saving time and money. The AI revolution is well on its way and you don’t want to be left behind. Get started at [nvidia.com/deploy-ai](http://nvidia.com/deploy-ai).

**Anthony Robbins** is vice president of public sector at NVIDIA.
Artificial Intelligence represents a powerful way to understand present conditions and predict future conditions. Given enough rich, high-quality, unbiased data, AI gives us the ability to create models that continue to learn and provide meaningful insights on an unprecedented scale.

Other analytics techniques do not require as much data to gain some understanding, but when there are massive amounts of data, machine learning and deep learning can produce more powerful insights, particularly when it comes to the sort of unstructured data agencies are awash in — free-form text, audio and video.

With AI, agencies can take advantage of object classification, video analytics, natural language processing and translation of unstructured data.

Ultimately, the technology gives us the ability to understand the present better by uncovering patterns and features that would have eluded humans or other analytics techniques.

Using data to understand and predict
We humans have a fundamental desire to answer four key questions: What is going on? Why is it happening? What’s going to happen next? And how can I influence it?

The government exists to help and protect people and our interests. To do that, it needs to understand current conditions in a range of areas — including social, economic and military defense — and be able to predict what might happen next. The more data the government can collect and analyze, the better it can protect us and our interests.

The ideas behind AI are not new. However, three elements have come together to create a perfect storm and push AI to the forefront. First, our ability to capture more digital data has grown exponentially. Although we’ve understood some basic ideas about machine learning and deep learning for decades, it’s only been in the last decade that we’ve had enough data to use those techniques in interesting enterprise, research and government applications.

Second, the advent of powerful processors and the adoption of graphics processing units make it possible to perform a tremendous number of computations on a vast amount of data. Along the way, the algorithms used for those computations have matured, adding the third element to the perfect storm for AI adoption.

Making sure AI is a force for good
Companies like Dell have helped commoditize computing and put it in the hands of government, companies and consumers. We provide vast storage capabilities for collecting and managing all that data, and together we can use advanced...
“We should embrace the tremendous **positive power of these capabilities** for government, industry and research while making sure to understand AI’s limitations and risks.”

AI techniques to get new meaning out of that data.

For instance, we can use AI to better understand cyberattacks and intrusion attempts on government networks and use AI-trained imaging to better understand threat conditions. In terms of public safety, AI tools can be trained to recognize the distinctive sound of a gunshot or identify human cries for help. We can also use AI in combination with simulation to understand how forest fires may evolve and thus save more people and more property.

We should embrace the tremendous positive power of these capabilities for government, industry and research while making sure to understand AI’s limitations and risks. Creating effective policies to ensure fair, responsible application of the technology becomes even more important now that we have systems that can learn, act and make decisions, even autonomously if we wish. We must be especially careful about how we collect and use the data to train those systems so that we protect against misuse and ensure that we achieve only positive societal impacts.

Jay Boisseau is AI and HPC technology strategist at Dell Technologies.
Most people are using artificial intelligence whether they know it or not through everyday technologies like Siri and Alexa. And then there are other people who are explicitly using it — for instance, through software-as-a-service tools for work or personal use.

AI is moving fast, and regulation can’t keep up with the pace of technological change. Therefore, it’s important that we avoid top-down command and control that would hinder innovation.

U.S. CTO Michael Kratsios published an op-ed on Bloomberg.com in January that outlines the Trump administration’s light-touch approach to regulating AI technology. In particular, the administration wants to encourage people from academia, industry, nonprofits and the general public to comment on AI rulemaking at federal agencies.

Red Hat is built on the core values of openness, transparency, community and letting the best ideas win no matter where they come from, so it’s gratifying to see that officials at the highest levels of government advocate having a wide range of groups figure out what those roles and policies should be and how we should create rules to promote fairness and transparency.

Eliminating bias and bad decisions
Machine learning involves training a model, and it is critical for leaders to understand how those models reach their conclusions. For instance, a machine learning model’s code may not be biased, but the data used to train the model could be. Further, as the model is used, it continues to learn. Although its decision-making is improved, the decisions it made in the past may not be the same decisions it would make today or in the future.

Being able to understand why decisions were made is critical to eliminate bias and bad decisions. Sometimes we need to know why an AI model reached the conclusion it did — for example, why it denied a veteran’s disability claim. In addition, machine learning can lead to patterns of bias and indirect racism, which further underscores the need for transparency. With some AI systems, however, there’s no way to tell how those decisions were made.

Open source technology can play a major role in providing the transparency needed to help identify bias and eliminate it. In addition to having source code that is open, the models and data must be accessible to third parties so they can independently replicate the results.

Closer collaboration for better outcomes
Predictive analytics, machine learning and AI in general aren’t intended to replace
Red Hat is built on the core values of **openness, transparency, community** and letting the best ideas win no matter where they come from.

people. Instead, they augment human activity so we can make better decisions and do more meaningful work. For example, business process automation can facilitate closer collaboration between the IT and business teams to ensure better outcomes. Business teams may never have needed to articulate their processes before, but business process automation requires it. This articulation leads to “aha” moments where improvements can be identified. Teams may also uncover opportunities to minimize choke points and single points of failure where only a few individuals know the details involved.

Best of all, business process automation can foster a shared sense of purpose between business and IT teams. AI helps us “do more with less.” As a result, AI frees government employees from spending their time on tedious manual tasks whose outcomes may not be consistently repeatable due to human error and misinterpretation. Instead, they can focus on improving citizen services and agency missions.

David Egts is chief technologist of the North America public sector at Red Hat.

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One of the most exciting things about technology and innovation in general is the rapid pace at which new capabilities are being brought to market. When it comes to artificial intelligence, there are tremendous applications available to help agencies automate repeatable tasks and even complex activities.

Generally speaking, agencies don’t have a data collection problem, but they do face significant challenges in making sense of all that data. That’s where AI can help. But before agencies can apply AI, they need to start by defining the insights they want to glean from their data. What questions are they trying to answer, or what do they want to accomplish? Then they should conduct an inventory of their data — whether it’s on premises, in the cloud, real-time or historical — and inspect the integrity, completeness and applicability of that data.

The next step is breaking down the physical and cultural silos that exist. Many agencies face technical problems in being able to access and enrich their data, but there’s also a very real cultural problem when it comes to sharing and accessing data across some of those silos.

Therefore, agencies need to build trust for their security and governance foundations and ensure that they can access the appropriate data that’s necessary to answer the questions they’ve identified. Once they’ve done all that, they can enable their teams with the training and technical resources necessary to use AI to sift through data to find the most relevant insights.

Setting new standards for IT operations
Incorporating new technology like AI requires some level of IT modernization for most agencies. Security and governance are key attributes of any modernization effort, but the ability to integrate new solutions into existing systems is also essential. Unfortunately, many of the government’s legacy systems struggle to keep up with growing demands for storing and accessing the unstructured data that fuels AI applications.

I recently developed a forecast for top technology trends in 2020, and a key prediction is that open-source software and approaches will become increasingly important for supporting all the data center traffic that is shifting to the cloud. In addition, the operating systems and applications that power automation and AI-enabled capabilities, among others, will continue to be built on open-source platforms that set new standards for IT operations.

Agencies that have an open architecture or a more flexible and agile approach to...
Security and governance are key attributes of any modernization effort, but the ability to integrate new solutions into existing systems is also essential.

IT are already seeing tremendous gains in productivity through new capabilities and efficiencies that previously weren’t possible.

**Avoiding vendor lock-in**
From our vantage point at Cloudera, success starts with having a comprehensive and independent data strategy, which includes an enterprise data platform where security and governance are key considerations and key attributes from the start.

There’s often a rush to get new capabilities developed, and then after the fact, organizations try to backtrack and insert security and governance requirements for sensitive data. That approach is inefficient and often ineffective.

Instead, agencies can benefit by establishing a data strategy and data platform that protects them from vendor lock-in and doesn’t discriminate against any types of data. Specifically, the strategy should encompass data at rest and in motion and have the flexibility to support current and future data formats so that agencies have the opportunity and ability to achieve the promise of AI.

Shaun Bierweiler is president of Cloudera Government Solutions.

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Artificial Intelligence is not new, but the challenge has always been curating and storing the terabytes of data that fuel AI. In addition, executing machine learning algorithms requires powerful computing resources that were typically only available on a limited number of supercomputers.

Fortunately, cloud technology has given us vast capacity for data storage and nearly unlimited compute capacity to take advantage of AI. Cloud technology has given us vast capacity for data storage and nearly unlimited compute capacity to take advantage of AI.

Extending edge data to the cloud
Gartner predicts that by 2025, 75% of data will be gathered by edge devices. The latest technologies make it possible to operate on real-time edge data and upload that data to the cloud. For example, Microsoft is helping the Tennessee Valley Authority leverage AI to prevent equipment failures across the 80,000 square miles of its service area. By gathering and analyzing data from far-flung equipment, TVA can be proactive about predictive maintenance and ensure...
consistent delivery of power.

We’re also working with the Agriculture Department on FarmBeats, an end-to-end system that enables seamless data collection and insights for agriculture.

Digital agriculture seeks to improve crop performance and reduce costs by giving farmers the ability to collect telemetry data through a variety of sensors installed on farms, as well as images taken by drones. Farmers then process real-time data using machine algorithms that are trained in the cloud to help them make more precise decisions about crop management.

In addition, recent legislation requires the Navy Judge Advocate General’s Corps to create an audio file that serves as the official record of a trial immediately after a trial has ended. Officials were spending $200 an hour — and waiting six to eight weeks — to have those recordings transcribed. When they switched to using the speech translation feature available through Microsoft Azure’s Cognitive Services, they dramatically reduced the turnaround time and cost for those transcriptions.

Addressing complex ethical challenges

AI raises many questions about the ethics involved in applying the technology to areas as diverse as battlefields and hospitals, as well as addressing inherent challenges related to bias in datasets. We should establish guardrails to ensure that AI platforms are providing good outputs and being fully transparent. And we should know how an AI tool reached its conclusion and how the data was collected, among other things.

For data sharing to work under the Federal Data Strategy, we must have a common data model and bilateral agreements. Specifically, government and industry need to answer questions about who owns data, where that data lives, who pays for storing it and how we can give other people access to it.

Microsoft is tackling those issues by creating Azure Data Share, which allows users to share large datasets while establishing some governance rules about who can access the data and what they can do with it. The datasets’ owners can see who’s using the data and revoke their access if they start to do something nefarious with the data or manipulate it in a way that wasn’t intended.

Of course, Microsoft is not the only company that offers AI tools in the cloud, which means good guys and bad actors have access to the technology. That’s why it’s so important for government and industry to establish agreements and governance to ensure the security and quality of data in the cloud. The U.S. should take a leadership role in crafting those standards and policies on the global stage.

Susie Adams is CTO at Microsoft.
GOVERNMENT AGENCIES HAVE access to more sensors and more data sources than ever before, but they need appropriate automation technology to make timely decisions. Artificial intelligence and the subfield of machine learning provide mechanisms for decision-makers to get more value out of their information by enabling faster analysis of more data.

Most federal agencies have too much data to analyze manually. Take the U.S. Geological Survey, for example. USGS works with NASA to distribute data from Landsat satellites and provide remote sensing photographs of the Earth. Millions of photos have been collected since 1972 — far too many for any organization to manually analyze every photo for information about how the world is changing.

However, with the help of new computer vision techniques that use neural networks, it is now possible to automatically detect changes in satellite images over time. Even more impressive, new machine learning algorithms can detect specific objects (e.g., cars, buildings, airplanes) in satellite images.

The bottom line is that machine learning can help agencies examine data that otherwise might never be analyzed by a human.

Frameworks that simplify AI adoption

Other AI techniques of particular interest to government agencies include natural language processing capabilities that can summarize lengthy text documents and pattern analysis algorithms that can detect anomalies in cybersecurity data.

Three major communities provide low-cost access to machine learning capabilities, and each is based on a specific framework. In 2015, Google released TensorFlow, a free framework that simplifies the creation and sharing of deep learning algorithms. Similarly, Facebook released its open-source machine learning framework, PyTorch, in 2016. In addition, Python scikit-learn has received major enhancements from more than 1,500 contributors worldwide.

In the same way that standardization enhanced innovation and lowered costs in automobile manufacturing, the standardization of machine learning around these three frameworks has greatly simplified the process for organizations to adopt the technology. TensorFlow, PyTorch and scikit-learn are all programmable with the popular Python language, have excellent online documentation and have seen massive adoption in the United States.

3 factors for AI success

We launched our company Black Cape because, based on our extensive experience in defense and national security, we had a new vision for how AI and machine learning could revolutionize national security. We are building a team of seasoned, mission-focused software developers and subject-matter experts to help modernize the way federal agencies conduct intelligence analysis and apply AI to mission outcomes.

We have found that the outputs of
intelligence analysis are driven by three main factors:

• **People.** First and most importantly, agencies need to assign clear leaders for AI efforts and provide them with resources and authority. AI prototyping and deployment also require a multidisciplinary team of domain experts, computer scientists and AI specialists. Optimally, the AI team should be physically colocated.

• **Process.** Solving a specific agency challenge must drive the process of testing and deploying AI capabilities. Agencies should have a concrete challenge (e.g., to speed up annotation of objects in photos), use a specific dataset (the archived photos from August 2019) and identify a desired end state (populating a database with a list of all the objects detected in the photos).

• **Technology.** To reduce risk and increase speed to deployment, we recommend starting with proven frameworks — such as TensorFlow, PyTorch or scikit-learn — and focusing on common use cases. Once you have some initial success, then you can take on a harder problem.

Abe Usher and Al Di Leonardo are co-CEOs of Black Cape.

The bottom line is that machine learning can help agencies examine data that otherwise might *never be analyzed by a human.*
As the use of artificial intelligence grows, we need to maintain vigilance so the technology properly integrates safety principles to help us manage and secure our data and models — and ensure the public’s trust in applications of AI.

It starts with secure, unbiased datasets. Algorithms and other foundational datasets must get monitored during training and inference to counter attack vectors such as corruption and data.

Taking such steps also strengthens compliance with legal requirements such as Europe’s General Data Protection Regulation, which imposes various limitations on data usage. The California Consumer Privacy Act is an example of emerging U.S. law regarding personal data.

In the United States, the Defense Department is working with the Defense Innovation Board, the Joint AI Center and the Defense Advanced Research Projects Agency (DARPA) on ethical AI principles, and the National Security Commission on AI is expected to issue recommendations early next year.

At Lockheed Martin, we understand that AI can be a powerful positive enabler for the benefit of society, and we educate our employees and work closely with our customers in the U.S. government and our allies around the world to ensure that data, systems and AI business models are transparent and their decisions can be understood in a manner consistent with mission context.

Focus on human-machine teaming
AI is a game-changer when it comes to training and enabling people to achieve success in complex missions.

In his book “Deep Thinking,” chess grandmaster Garry Kasparov pointed out that average chess players fare better when partnered with a machine than expert players do. That’s because experts question the machine’s recommendations based on instincts developed through the years.

We train Air Force pilots over many years to become experts at flying into battle. With AI in the cockpit, highly trained pilots will sometimes question the recommended directives produced by a model’s inferences, especially when those directives are counterintuitive. Therefore, to build trust between the pilot and an AI-enabled system, the human-machine interface should start early in the training process. Humans need to learn how to partner with a machine to supplement their ability with the machine’s capabilities.

Apply AI wisely
Some mission profiles may not be appropriate for reliance on deep neural networks whose complex inner relationships cannot be precisely explained. If we apply AI to use cases like predictive maintenance, the risk of an inaccurate prediction is somewhat minimized. We still have a lot of
Our customers are counting on us to **collaborate and strengthen public trust**, and we’re fully invested in that partnership.

work to do to develop robust AI solutions that meet or exceed the high standards of our legal, regulatory and ethical frameworks — so other use cases on the battlespace will require that humans continue to be a critical part of the decision cycle.

DOD’s Joint AI Center is identifying where to apply AI today and where to pause and do some fundamental research through partners like DARPA to prepare us for the next wave of AI.

As in all other aspects of our business, we will continue to apply our ethical principles when we adapt technologies such as AI to advance innovation. That includes understanding any inadvertent harm to persons, which can often attract disproportionate attention. However, we believe the human-machine symbiosis, when overseen properly, will continue to evolve and yield breakthroughs in the nature of work and positive societal impacts.

Our customers are counting on us to collaborate and strengthen public trust, and we’re fully invested in that partnership.

Matt Tarascio is chief data and analytics officer and Chris Benson is principal AI strategist at Lockheed Martin.
The importance of adding context to data

The success of AI and machine learning is rooted in the speed, quality and correlation of data.

Artificial Intelligence is the key to finding relevant information in a sea of data as a source of value creation and delivery to gain a competitive advantage. AI can offer invaluable insights into public sentiment, help agencies resolve security-related IT events and support a comprehensive approach to critical infrastructure protection.

By leveraging advanced correlation and aggregation techniques, agencies can use AI to eliminate redundant or non-important information and thereby improve mission outcomes. For example, Micro Focus Government Solutions feeds our advanced security information and event management system with data from log file collectors to greatly reduce irrelevant data, improve cyber hunting and detection, and fuel predictive analytics.

Focusing on the most relevant information

Agencies need to go beyond just capturing volumes of data to providing a system of insights and knowledge in context with mission priorities to facilitate digital operational decisions. Generating actionable insights requires the ability to correlate data from any source and in any format, including images, video and audio. That’s why Micro Focus couples our Intelligent Data Operating Layer (IDOL) technology, developed as part of HPE’s Autonomy, with advanced techniques for enriching data and enabling knowledge discovery with rich media analytics.

This approach enables agencies to keep pace with what’s happening in their internal call centers as well as email, social media and the news media in context with their mission objectives — for example, by assessing public sentiment about the latest policy statement or government trade agreement to refine agencies’ communications strategy.

With IDOL, agencies can use patterns to understand unstructured and structured data from an extensive, diverse library of data. They can then zero in on the most valuable information and disregard irrelevant or low-priority information.

Federal and local agencies can combine that information with physical security data to monitor borders or better assess the threat levels during large public events. By putting all that information in context, agencies can create a critical infrastructure monitoring solution that aligns with the Department of Homeland Security’s National Infrastructure Protection Plan.

A centralized approach to data protection

Understanding that data is a strategic asset, agencies should ensure that data protection is built into their strategies for AI and analytics. Although agencies have many ways to encrypt data at rest and in transit, there are still major gaps in security when data is in use. In particular, many agencies struggle to protect data when it is pulled from secure systems for analysis or shared with other agencies.
Fortunately, tools like our Voltage SecureData technology can encrypt data in use without hindering analytics. We leverage a format-preserving encryption standard, recommended by the National Institute of Standards and Technology, to encrypt data even when it is in use so that if the data is breached, it is unusable to bad actors.

In addition, agencies must understand where data resides in order to protect it. However, duplicate data is often stored in redundant troves by various business areas. Agencies could better protect this data and reduce risks by discovering and removing duplicate copies and centralizing a data protection scheme.

Treating data like a strategic asset requires an enterprise-wide approach and advanced information management and governance techniques. But agencies have tremendous potential to save money while creating a more secure yet flexible IT environment. In addition, they can make significant progress on the cross-agency priority goal for workforce improvement by allowing federal employees to focus on strategic activities.

David Wray is CTO at Micro Focus Government Solutions.

Generating actionable insights requires the ability to correlate data from **any source and in any format**, including images, video and audio.

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A sector, the amount of data that agencies collect continues to grow exponentially. The question is: How do we channel the information that comes from all this data toward the most effective outcomes?

Artificial intelligence allows the government to harness the power that’s already available in various datasets to make more informed and more accurate decisions on behalf of citizens. AI does that by giving agency subject-matter experts the ability to quickly solve complex problems without relying on manpower in the form of dedicated data science teams.

Ideally, agency employees should be able to take advantage of AI without having to get a Ph.D. in data science. That’s where automated machine learning can help.

Using automation to find the best data models
An automated machine learning platform like DataRobot’s can create a new class of citizen data scientists and put the power to create advanced machine learning models into the hands of agency domain experts without having to learn to code or understand when and how to apply certain algorithms. We help citizen data scientists leverage their agency’s data, automate the process of testing the effectiveness of different algorithms, and determine the best models for predicting and describing the data.

For instance, if we want to reduce fraud in loan applications and we know that 10,000 of the 1 million applications submitted in the previous year were fraudulent, automated machine learning can quickly identify the attributes that signal fraud in those applications. DataRobot’s platform can take in the data, prep it and test it against over 400 types of models to figure out which are the best for zeroing in on fraudulent applications.

Typically, a data scientist would go through that process manually. Automated machine learning helps make data scientists more productive because repetitive steps in the model-building process are automated. This frees them to use their unique expertise for selecting and fine-tuning models, helping them accelerate how they address potentially hundreds of problems a year.

In any area that collects a lot of data with a known outcome, automated machine learning can help predict a future outcome. In addition to preventing fraud, some major initiatives we’re working on include human resource planning in the form of selecting the best candidates quickly and predicting retirements so that agencies know where they might need to staff up.

Automated machine learning also helps with predictive maintenance for vehicle fleets, logistics planning, cybersecurity and complex workflows in places like hospitals.
Ideally, agency employees should be able to take advantage of AI **without having to get a Ph.D.** in data science.

**Educating employees on the art of the possible**

In order to stay competitive in AI on the world stage, we need to educate our workforce and help employees reach a baseline level where they can understand the art of the possible in how AI can make a difference in government. DataRobot is helping government agencies across several use cases, including insider threat, fraud, predictive maintenance, public health and safety, and employee attrition. The possibilities are endless.

Educating citizen data scientists is one of the key areas where DataRobot has been helping agencies get to the next level of AI adoption. Through our DataRobot University, we offer classes for data scientists and also for executives, subject-matter experts and anyone who wants to help make their projects more successful and create an impact.

The people who have the best knowledge of their data should have the opportunity to expand their capabilities and use AI to find answers to the questions they encounter in their daily work.

*Eric Forseter* is general manager of public sector at DataRobot.

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**Leverage AI in the Public Sector**

By harnessing the power of AI and automated machine learning, DataRobot gives government agencies the insight they need to power and drive their missions forward.

Learn more about why the Public Sector should use AI at [datarobot.com/public-sector](http://datarobot.com/public-sector)
BLOOMBERG REPORTED THAT the federal government spent $2.6 billion on tools to manage, analyze and visualize data in fiscal 2019. Even with that amount of spending, however, agencies are not able to properly leverage their data for informed decision-making and mission effectiveness.

The current process for creating reports and finding insights in data depends on those with technical skills and is complex, slow and inflexible. Reports are often built on an aggregated view of the data, and dashboards rarely address everybody’s needs. So users end up with a static snapshot that leaves the next question unanswered.

The best of both worlds
A key tool in tackling those challenges is natural language search, which we use with Google, Amazon and a host of other tools in our everyday lives to instantly answer a variety of questions. When applied to enterprise datasets, the familiarity of search helps speed decision-making and bridge the talent gap because it reduces the need for training. This, in turn, empowers agency employees to engage with data in a more agile, productive way.

People aren’t equipped to manually sift through massive amounts of data to find patterns. But we thrive when it comes to interpreting those patterns and identifying the best path forward. When you augment human skills with technology, you get the best of both worlds.

With search-driven analytics, logisticians could more rapidly prepare for military deployments or humanitarian relief efforts because they can quickly identify where the people with the right skill sets are located and where the equipment is. Combined with their own situational awareness, they can then determine the most efficient way to deploy those resources.

Using data to solve real-world problems
I’d like to share a story that Jose Arrieta, CIO of the Department of Health and Human Services, often uses to talk about the importance of using data. Imagine a recently divorced mother who lives in rural upstate New York. When she hurts her back on the job, she’s prescribed an opioid. She spirals into opioid addiction, becomes very sick and develops life-threatening sepsis. The small local hospital is unable to treat her so she is airlifted to a larger hospital in a nearby city, and doctors there are forced to put her on an array of harmful drugs to keep her alive while they wait for lab results to confirm the most effective medication.

Now imagine if you incorporate AI into that story. Applying AI to social determinants could have signaled a potential mental health issue, making
People aren’t equipped to manually sift through massive amounts of data to find patterns. But we thrive when it comes to interpreting those patterns.

Doctors aware that their patient might be at risk of opioid abuse before they prescribed the medicine. AI could also analyze other data so the doctors could quickly identify the best treatment before her health deteriorated.

More broadly, AI applied to data, or augmented analytics, can also identify underlying trends in our current opioid crisis and allow officials to react before a community finds itself in crisis. Using a publicly available Drug Enforcement Administration dataset, ThoughtSpot’s platform took only seven seconds to analyze 21 billion rows of data and identify 17 outliers, including the providers and distributors that had been overprescribing opioids. Imagine the potential for applying this kind of technology not just to DEA data, but to datasets from any agency—truly allowing users to find that “needle in a haystack.”

With platforms like ThoughtSpot, even nontechnical users can leverage the power of AI to overcome government’s biggest challenges and, in doing so, create a better America for us all.

Monica McEwen is vice president of public sector at ThoughtSpot.
Executive Viewpoint
A Conversation with KEN THOMSON

KEN THOMSON
BuySmarter Solution Architect,
Department of Health and Human Services

A BuySmarter leader discusses how HHS is using artificial intelligence as part of a data-driven initiative to leverage the department’s collective purchasing power.

How is HHS using artificial intelligence to improve acquisition through its BuySmarter initiative?
The RelImagine HHS transformation effort launched the BuySmarter initiative with the mission to deliver a holistic capability that enables the U.S. Department of Health and Human Services to leverage its tremendous buying power as a singular buying entity. BuySmarter is based in an enterprisewide category management concept, which follows the group purchasing organization model used in the health care industry to bring the collective buying power of health care providers to deliver cost savings and optimal terms and conditions.

Given the size and complexity of the federal procurement process, the BuySmarter team will “AI-enable” the process of bringing agencies together to acquire goods and services as one.

HHS has over 40 different contracting shops across the 20-plus operating and staff divisions, each buying similar and frequently the same goods and services at disparate prices. Due to siloed purchasing, HHS agencies have minimal buying power, and vendors thus have the advantage in contract negotiations. In other words, the vendors have an advantage as smart sellers.

To shift this power equation in favor of the government, HHS is using AI to centralize its contract information into a single data layer, converting contract and attachment data into metadata (plain text), structuring it by category and sub-categories, and building a universal taxonomy for how to understand the information in a common way. The AI identifies where we are buying “like-to-like” goods and services across our divisions utilizing data algorithms derived from the variables developed by HHS contracting and mission subject-matter experts (SMEs).

The algorithms list every variable that could drive pricing (e.g., a registered nurse working in New York vs. Iowa). Our Category Collaboratives – the groups of SMEs and contracting professionals in charge of a category — will have the full suite of information on every vendor’s pricing, delivery, logistics, quality, support and more for a group purchase of a product or service. The new AI tool will empower HHS divisions with new levels of negotiating power.

What new developments are in the works for BuySmarter?
HHS is in the final phase of developing the AI capability described above, known as the Full Contract Scan (FCS) Tool, for the medical category. It has already ingested 1.37 million documents comprising 4.6 billion words with the taxonomy built from the primary category (product, equipment and service) down to the sixth sub-category level.

Using natural language processing, the team developed an inference protocol that allows the AI tool to “read” in a human way and make logical inferences when matching words and phrases. For example, when searching for “neonatal nurse,” the AI tool makes the logical leap that “NICU” belongs alongside “neonatal” in other search results.

The user interface will be simple and familiar, with similarities to Microsoft Excel. Our initial human-centered design sessions received positive feedback, despite demonstrating just four screens while behind the scenes the tool is grinding through 1.37 million documents in mere seconds.
The new AI tool will empower HHS divisions with new levels of negotiating power.

We will complete the build of the FCS tool on March 31. After that, we will be in a great position to do some presentations to our fellow departments.

How has HHS prepared the acquisition workforce to embrace the new tools?
Stakeholder engagement and mission focus are the foundation of the entire BuySmarter effort. We engaged the agency heads of contracting activity to be our Planning and Development Committee from the onset. Every aspect of the people, process and technology for BuySmarter is designed with their guidance.

We have also staffed our Category Collaboratives to lead each category and sub-category with volunteers from across HHS agencies. These teams will then launch the Sub-Category Pursuit Teams on individual product or service acquisitions, which will bring together SMEs from all the buying agencies. This entire community is currently engaged in our human-centered design sessions for the FCS Tool.

What lessons have you learned along the way?
I learned to adapt my approach to a more hands-on engagement with the vendor where we built the tool together. The phrase “AI learns” holds true, but you have to “teach the teacher.” This translates to the need for experts in that domain to sit with the AI development team and teach them what the tool needs to do, how the data should be structured, what the outputs need to be and more.

We have all heard of agile as a quicker way to conduct development in two-week sprints. When it comes to building AI tools, the process is even quicker. I call it “full-contact development.” We meet daily with our AI vendor to give guidance and clarity on what the tool should do. Then we start bringing in waves of SMEs to study the tool and help teach the teachers to improve the capabilities. This full-contact development approach is truly what it takes to build a robust AI tool.

What impact is BuySmarter having on the department’s overall acquisition strategy?
Led by David Dasher, deputy assistant secretary for the Office of Acquisition and the HHS senior procurement executive, the BuySmarter initiative is incorporated into the department’s approach to category management. The BuySmarter initiative is scheduled to “graduate” from the ReImagine portfolio to become a program operating from the HHS Office of Acquisition, institutionalizing the change and shifting the acquisition culture of the department.

What advice do you have for other agencies that want to apply AI to their mission challenges?
From the many skinned knees experienced early on in this project, we have developed an AI Microservice Request Tool that clearly states the core elements needed to craft a comprehensive AI tool. Well before you endeavor to build an AI tool, you must fully and clearly define the following elements:

- Define the mission challenge. What exact problem are you trying to solve?
- Define the impact statement. What specifically is the tool going to do to improve your mission?
- Identify the data and systems. What data are you pulling from what systems, and who owns them?
- Define the SMEs. What SMEs will you need to engage to “teach the teachers” on what the data should do, and at what point in the development of the tool should they engage?
- Define the users. Who will be using this tool?
- Define the customers. Who will benefit from what this tool accomplishes?
- Describe the process steps. What are the detailed process steps that the tool will accomplish task by task?
- Define the output. What will the actual deliverables be for the tool?
- Define the security requirements. What data is resident in the tool, and what security protocols need to be in place for that data?