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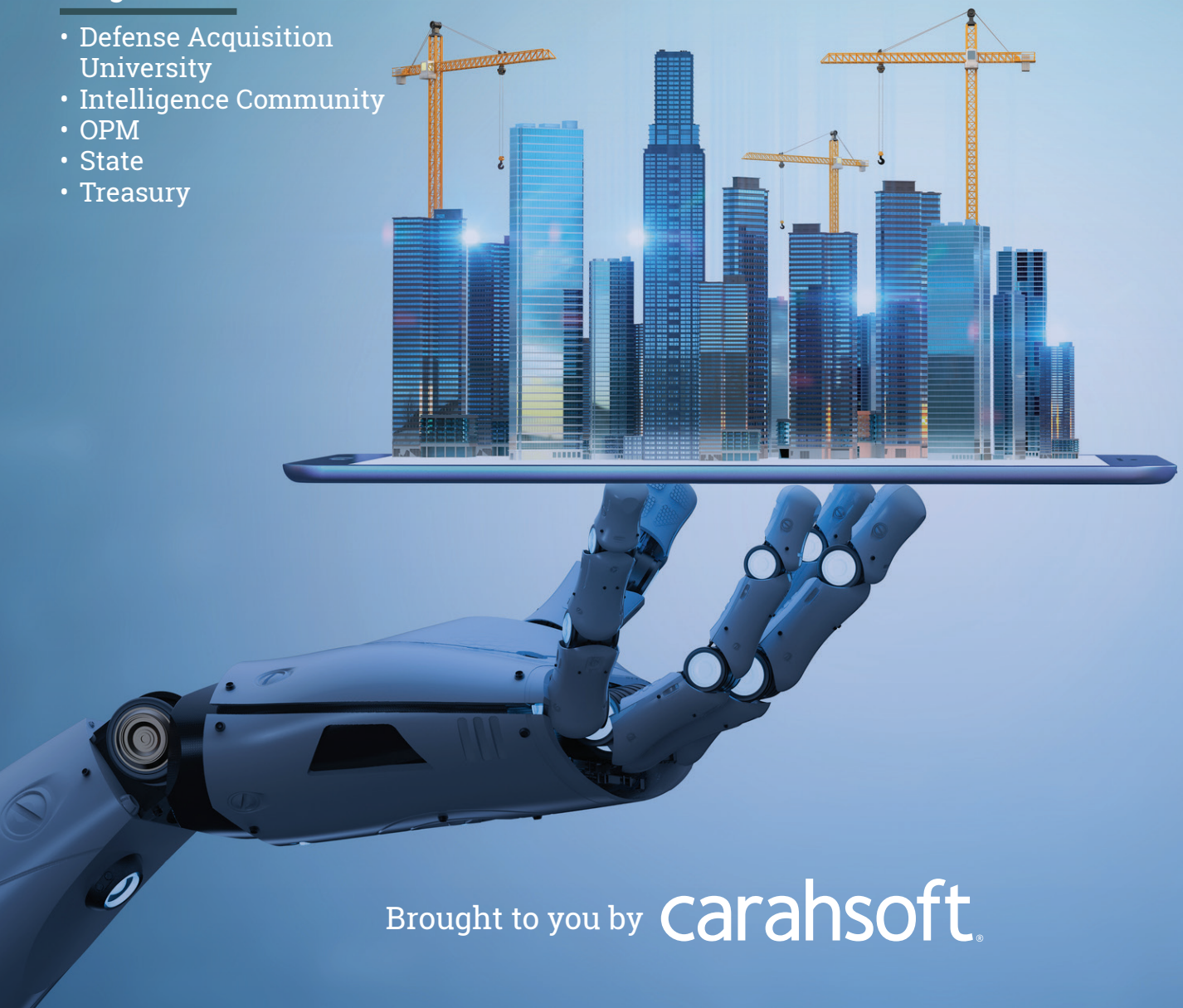

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Ante in for AI

It might seem like agencies are hesitant to adopt artificial intelligence. But really, it's quite the opposite.

As Lori Wade, the Intelligence Community's chief data officer, put it: "It is no longer just about the volume of data, it is about who can collect, access, exploit and gain actionable insight the fastest." *(Read the full story about how the IC plans to gain an edge with AI.)*

The realization is clear: Humans alone cannot keep pace. They need AI so they can make decisions based on the most relevant and most current information — and make those decisions in a timely manner. It's really as simple as that.

That doesn't mean agencies are willy-nilly ramping up AI use. As the articles in this ebook attest, they are strategically planning and developing roadmaps for their expansion of AI — thinking through how to implement the technology expeditiously while protecting the data so critical to mission success. Often, that does involve real-world programs and pilots.

"We're doing all of this by being mindful of the importance of both policy, governance and strategies that allow us to do this responsibly," points out Giorleny Altamirano Rayo, chief data scientist at the State Department. *(Read the full story about State's AI strategy.)*

In the pages ahead, you'll be able to pick up pointers on data management and AI not only from the IC and State, but also from the Defense Acquisition University, Office of Personnel Management and Treasury Department.

Plus, experts from industry also offer a glimpse at the latest technology developments, share best practice tips and reveal the early value that AI is delivering to agencies across government.

We hope this ebook helps you as your agency continues to broaden how it will corral data and make smart use of AI.

Vanessa Roberts
Editor, Custom Content
Federal News Network

OPM looks to take agencies' data innovations governmentwide

BY DREW FRIEDMAN

Now that the Office of Personnel Management has set data goals to reach over the next few years, the agency is seeking new ideas from across government that can scale.

OPM's fiscal 2023–2026 data strategy, initially released in May, hinges on developing proficiencies in data and analytics skills for the federal workforce as well as using data to improve employee satisfaction and customer experience.

And although OPM houses data on talent acquisition, benefits, demographics and much more for the 2.1 million current federal employees, along with federal retirees and annuitants, its resident data experts said they recognize they don't have all the answers. OPM, though, has the unique ability to bring other agencies' ideas to a broader level, the experts said during a Digital Government Institute event.

"What we need to do is build a system where OPM can learn from the agencies that may be more advanced, in some respects, than we are," said Steve Krauss, an OPM senior advisor for the HR Quality Service Management Office and the HR Line of Business. "Then we can institutionalize some of the things that those agencies are doing and make that available to the community at large."

Building on smart ideas everywhere in government

For example, OPM recently incorporated a tool from the National Institutes of Health, first developed back in 2018, that streamlines data from the annual Federal Employee Viewpoint Survey. NIH's Excel-based program pulls data points from each main theme of the annual FEVS; organizes the survey results based on those themes by agency, subcomponent and office; and then shows the change in responses for a specific item over the years.

OPM employed the NIH tool when creating larger data dashboards, something the agency has been working on for the last few years.

"We're now scaling that tool around FEVS, which we have incorporated into our ideas around the dashboards that we're now going to build for agencies," OPM Chief Data Officer Ted Kaouk said. "We're looking for your ideas. We want the innovation to continue with OPM [and] we want to continue at the agency level."

Developing dashboards for agencies to better understand and use their workforce data is another goal of the OPM data strategy. A few years ago, the dashboards started out small, beginning with basic HR data. But now, OPM is looking to expand its

"We've got every system that touches every employee, even including our Federal Employees Health Benefits (FEHB) systems. Some of them are outsourced, but we still provide oversight and management. The richness of that data is huge. How do we share that data in a way that agencies can leverage?"

— Melvin Brown, Deputy CIO, OPM

dashboards and go deeper. As part of its dashboard development efforts, OPM is trying to understand where gaps in data exist too.

For instance, one area OPM is now keying in on is improving attrition data. The agency plans to focus on how to gather and use information on workforce attrition to better understand employee engagement and satisfaction.

"Being able to focus on where attrition is most acute, what's the makeup of those departing staff and really being able to ramp up the maturity and analytics from descriptive, to diagnostic and prescriptive," Kaouk said. "That's something we're going to be focused on this year."

OPM is also trying to expand the accessibility of the dashboards to reach more agencies.

"We began to solve some of our technology authentication challenges with access to the dashboards and the systems," OPM Deputy Chief Information Officer Melvin Brown said. "We just cracked the nut on some of our Defense Department partners, so now we're able to share that data with them — that's been huge."

Leaning into partnerships and collaboration tied to data

Along with proliferating the dashboards, OPM wants to launch more pooled hiring actions to recruit data scientists and other professionals across agencies. There have already been a couple of successful pooled recruitment efforts in the last few years, but OPM is looking to help agencies establish even more.

But as both technology and data develop over time, hiring for these specialized positions will require OPM and all agencies to pivot their recruitment strategies to reach necessary skill sets in data.

"When we talk about empowering the workforce with data, you also need to be thinking about the workforce itself as a moving target, in terms of the profile of what that workforce is comprised of," Krauss said.

"Our modernization efforts directly support, especially on the technical side, retaining the talent and being able to enable them."

— Ted Kaouk, Chief Data Officer, OPM

"We will not be able to retain this talent if they don't have access to the right tools and technology to be able to use the skills that they have," Kaouk added. "Our modernization efforts directly support, especially on the technical side, retaining the talent and being able to enable them."

Carrying out these data plans will also involve a lot of collaboration and support with OPM's Office of the CIO to help build both the technology and platforms necessary to support the work. To implement the data strategy, transparency and consistency are key, Brown said. "And do it in a safe and secure manner, so that we don't create inequities of data where we have the 'haves' and the 'have-nots.' "

"We don't want to leave agencies behind that might be less monitored than other agencies," he continued. "That's what we're trying to do right now."

One common challenge for agencies is that although they can access data from certain agency components, many lack an enterprise view of their data, Brown said.

"That's one area where OPM can deliver value, but it's also an area where agencies themselves continue to lean in," he said. "We've got every system that touches every employee, even including our Federal Employees Health Benefits systems. Some of them are outsourced, but we still provide oversight and management. The richness of that data is huge. How do we share that data in a way that agencies can leverage?"

How to revolutionize government translation with generative AI

Government officials increasingly sound the alarm over the limited number of trained and qualified linguists.

Almost every national security and defense organization worldwide has a foreign language component, and translation workloads for both investigators and linguists are increasing. The amount of foreign language material continues to outpace the government's ability to translate accurately, at volume, at scale and at an acceptable speed.

Accelerating advances in technology and the increasing volume of foreign language evidence collected threatens to outpace the ability to translate and exploit this data at the speed of relevance. What's the solution?

Tackling tough translation challenges by integrating AI

In situations where accurate and timely translations are crucial, the shortage of qualified and vetted linguists poses significant challenges, said Jesse Rosenbaum, vice president of business development and national security at Lilt. Equally, nonlinguist analysts are not equipped with secure, at-desk tools to translate foreign language material at the speed of relevance.

For example, during the ongoing war in Ukraine, there has been a scarcity of linguists available to provide real-time updates on the ground. This shortage not only has affected the ability to gather vital intelligence but also hindered the timely dissemination of information to national security and defense agencies in the U.S. and abroad.

This is particularly important for agencies that rely on accurate translations for their operations, such as the U.K. law enforcement community, which faces frequent challenges to review evidentiary material under a tight timeline, Rosenbaum said. To ensure national security and effective decision-making, it is imperative to augment these linguists' capabilities with an artificial intelligence translation solution, he added.

AI translation systems that can understand and interpret the context of a given situation or query to provide more relevant and accurate responses or outputs can improve quality, enable higher accuracy and reduce errors over time.

Industry leaders such as Intel have partnered with Lilt to transform their localization programs using AI, leading to greater efficiency without sacrificing quality. In only a few months of using Lilt, Intel achieved significant savings on translation costs, Rosenbaum said.

"What's unique about our technology is that as the translators are translating texts and reviewing translation prompts, as they make corrections, those corrections are essentially retraining the model in real time."

— Jesse Rosenbaum, Vice President of Business Development and National Security, Lilt

Reducing costs while improving translation capabilities

Lilt's Contextual AI Engine is instantly retrained using linguist feedback, enabling Intel to translate the same amount of content while reducing costs by 40% year over year. The impact of that reduction is significant, enabling one of Intel's business units to double its volume of translated content with only a marginal increase in budget.

"We've now deployed with a European law enforcement agency — using our technology to expedite the foreign language translation content they have in order to support their operations making subsequent arrests and prosecutions. I'm excited to explore enterprise-grade deployments to government agencies," Jesse Rosenbaum said. "We're able to provide so much more training data to the software."

Companies that use AI for translation can increase linguist productivity and ultimately increase the translation velocity and accuracy for federal agencies and organizations.

"What's unique about our technology is that as the translators are translating texts and reviewing translation prompts, as they make corrections, those corrections are essentially retraining the model in real time," Rosenbaum said. "The next time it runs across that phrase or that word, whether that's coded language or something slang that's unique to a particular group, the program learns. The next time it sees that phrase, the AI gives a more accurate response."

Helping not replacing translation teams with AI tools

This capability is vital across the spectrum of national security and defense agencies, where complex technical language, dialects, slang and colloquialisms are business as usual, he said.

When deployed in support of the European law enforcement agency, the Lilt technology was able to translate an entire caseload of messy social media data in weeks rather than years. Lilt's AI-powered platform has prevented resource issues from limiting the agency's effectiveness in stopping crime by deploying a versatile workflow of at-desk tools, Rosenbaum said.

Nonlinguists work autonomously, using machine translation to triage a variety of documents for high-value content, including sending bulk translations through their application programming interface. Linguists can then focus their time and skills on translating evidentiary documents using Lilt's predictive CAT tool. This workflow has been deployed in major operations, aiding in hundreds of criminal arrests and confiscation of illegal drugs and weapons, he said.

Using Lilt's Instant Translate app, law enforcement analysts were able to translate high volumes of data to cull valuable information, so linguists could focus their skills translating the most relevant documents on the Lilt Platform.

"This was not possible five years ago," Rosenbaum said. But with today's AI technology, it is.

"AI is not going to replace human work in translation because of the inherent complexity of language. What the software allows them to do is work much faster and to be able to focus on the things that they're the really best at, like using their intuition and expertise."

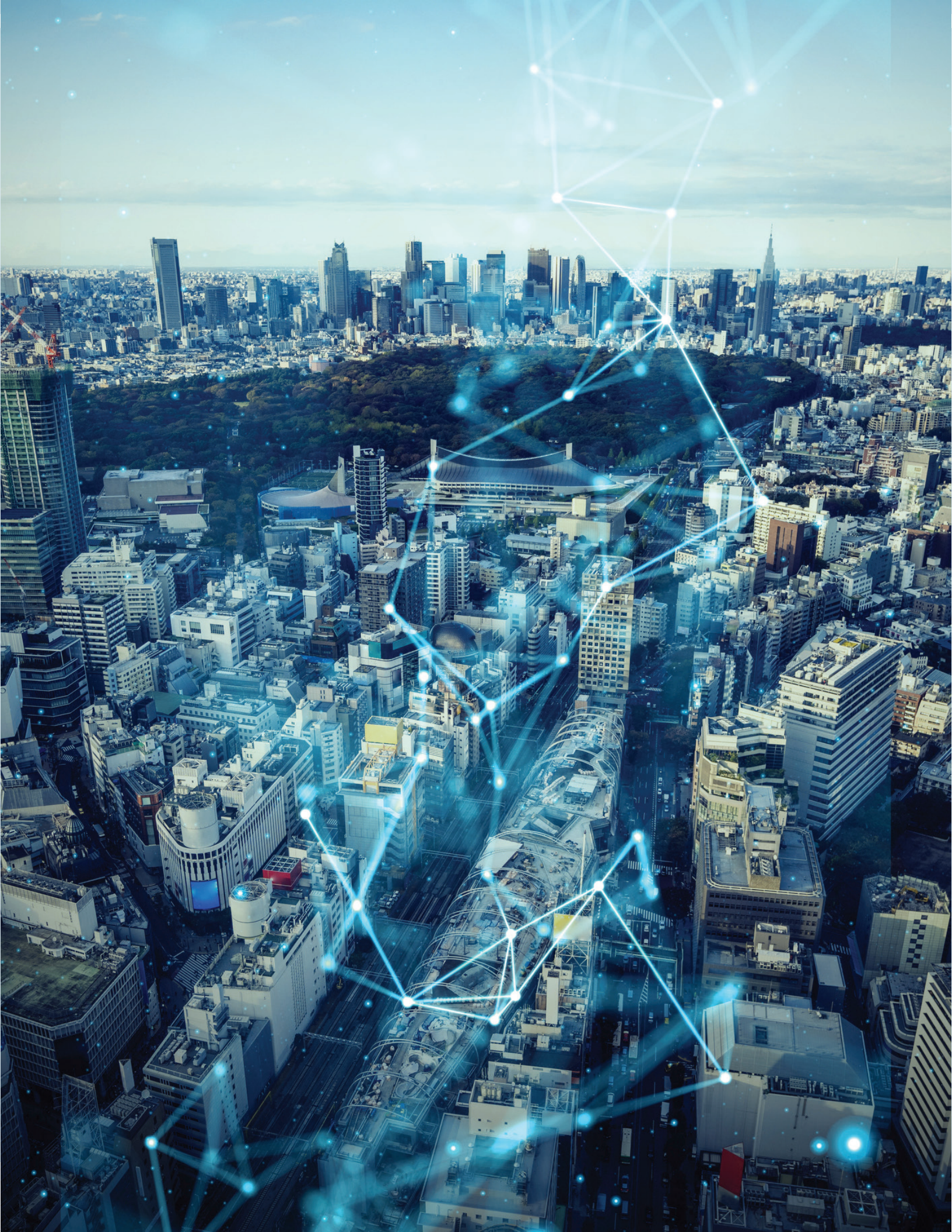
"AI is not going to replace human work in translation because of the inherent complexity of language. What the software allows them to do is work much faster and to be able to focus on the things that they're the really best at."

— Lilt's Jesse Rosenbaum

The software is also able to meet organizations where they are, he said. It can operate in a closed network without connectivity to the internet to protect sensitive documents and meet security compliance standards. As many federal agencies continue on their cloud adoption journey, the technology is perfectly positioned to reap the benefits of scalable computation and shareability of information, Rosenbaum said.

AI is only starting on a journey that's likely to change nearly every sector of life, he pointed out. But AI-powered translation is a compelling future vision. One where AI translation is democratized across the national security and defense community, and where allies from different countries will be able to talk to each other during real-time battle situations without any loss of nuance or context, Rosenbaum said.

"The amount of multilingual content our agencies face will only continue to increase. Now is the time to seize the opportunity to adopt AI solutions and make a significant impact in the world of government translation."



Treasury sees greater data sharing as critical to curbing improper payments

BY JORY HECKMAN

Agencies saw a governmentwide decrease in improper payments last year, after a surge of them at the height of the COVID-19 pandemic.

Now an interagency group is drafting a playbook to build on those pandemic-era lessons.

Members of the Joint Financial Management and Improvement Program are planning to release a three-year Payment Integrity Plan.

JFMIP members include the Government Accountability Office, Office of Management and Budget, Office of Personnel Management and Treasury Department.

The strategy is focused on getting agencies better access to data to proactively stop improper payments, said Renata Miskell, deputy assistant secretary of Treasury for accounting policy and financial transparency.

"It's really all about paying the right person the right amount at the right time," Miskell said. "When you receive a check, or ideally a direct deposit into your account, that's really one of the most direct ways that you actually interact with the government. It's also one of the most important functions that the government performs, so it's important that we do it with integrity and do so in a way that prevents improper payments and fraud."

Miskell said the Payment Integrity Plan focuses on getting agencies access to data and analytics key to real-time prevention and detection. She added that a lack of access to data remains a root cause of improper payments.

To further reduce improper payments, Congress is giving Treasury's Bureau of the Fiscal Service access to the Social Security Administration's Death Master File. The bureau handles about 90% of all federal payments.

Miskell said the bureau will have access to the SSA files for three years, starting in December 2023. The bureau plans to make full use of this data in the hopes of convincing lawmakers to permanently codify this access, she added.

"It's actually really challenging to get access to that whole Death Master File, both in terms of cost, and also because of privacy and security reasons. It's really all about breaking through some of those complex challenges and making it easy to do the right thing," Miskell said. "We hope to just have permanent access in general, because we know that this is a very valuable data set that can be challenging to access for a federal agency."

Treasury pilots new payment verification tools

The Fiscal Service established an Office of Payment Integrity in early 2023, bringing its Payment Integrity Center of Excellence and Do Not Pay under one roof.

The bureau also piloted a commercially available account verification tool to verify whether bank accounts belong to the individuals or organizations that receive payment.

Miskell said this tool helped the bureau screen pandemic-era Economic Impact Payments and Advance Child Tax Credit payments and prevented the federal government from issuing about 130 million improper payments.

The bureau is also piloting tools that will make it easier for Supplemental Nutrition Assistance Program (SNAP) and Medicaid enrollees to verify their income and eligibility.

"There are people who are nontraditional earners, who may not have a history with commercial services that provide that information. And then the commercial information is also really expensive, so if you're a state or if you're a federal program, it can be really challenging to find dollars to pay for that service," Miskell said.

130M

The number of improper payments prevented by the pilot use of a bank account verification tool to screen pandemic-era Economic Impact Payments and Advance Child Tax Credit payments

SOURCE: Bureau of Fiscal Service

Partnering also promises to help reduce improper payments

The three-year Payment Integrity Plan is also focused on strengthening interagency partnerships to reduce instances of improper payments.

Miskell said the majority of improper payments stem from federally funded, state-

Artificial intelligence, if used responsibly, could become a "game changer when it comes to enabling real-time prevention and detection."

— Renata Miskell, Deputy Assistant Secretary for Accounting Policy and Financial Transparency, Treasury

administered programs like Medicaid and federal-state unemployment insurance program.

OMB, in a blog post in December 2021, found improper payments grew most under the Federal–State Unemployment Insurance program, which saw its improper payment rate reach nearly 19% — eight points higher than pre-pandemic rates.

"We know that problems accumulated from early in the pandemic are still being discovered and will take a long time to clean up," OMB noted in the blog post.

Improper payments include overpayments, underpayments, as well as payments in the right amount to the right person but not strictly adhering to legal or regulatory requirements.

"Coming off of the pandemic, we saw how important partnerships were in response and recovery efforts," Miskell said. "It's important to strengthen the partnership with the states that administer these programs, and really help make the connection between the federal resources and the state challenges."

The Fiscal Service partnered with the Federal Emergency Management Agency when standing up its COVID-19 Funeral Assistance program. The bureau helped provide account verification services to ensure the FEMA funds covered legitimate funeral expenses.

"They asked us, 'Hey, this program could be subject to lots of fraud. Can you help us?' So we proactively engaged with them; we shared tools," Miskell said.

Miskell said the Fiscal Serviced helped FEMA avoid about $86 million in potentially improper payments through its funeral assistance program. FEMA estimates it awarded $2.8 billion in payments through the program.

Treasury seeks to scale payment integrity efforts

The three-year plan is also focused on scaling up payment integrity programs across the government.

GAO found in a recent report that agencies saw a slight decrease in improper payments in 2022, compared to the year prior.

"The decline is a step in the right direction, and I think it reflects the ongoing collaboration and the tremendous — almost herculean — efforts that agencies took to put controls in place to prevent fraud and improper payments," Miskell said.

As agencies look to further reduce improper payments, they'll also have to balance program integrity with payment speed.

Miskell applauded agencies for getting emergency funding out to the public quickly. She estimated that at the height of the pandemic the federal government issued $400 billion in pandemic relief spending in a matter of days.

"That's great. We were able to deliver funding in record time to help provide relief. But at the same time, we saw fraudsters taking advantage of that record-breaking assistance and exploiting those vulnerabilities," she said.

GAO, as part of this effort, released a guide to reduce payment errors and fraud in emergency assistance programs.

"It gives really some concrete and practical steps that program managers can go through to set up that

> **"Fraud has always been kind of something that's been out there. But the speed and the magnitude at which it occurs and can occur is really kind of the biggest change."**
>
> **— Treasury's Renata Miskell**

program to make sure that they're assessing risk," Miskell said.

Looking to future tools to help stem fraud

To reduce improper payments across long-standing federal programs, Miskell recommended that agencies address vulnerabilities that their inspectors general have highlighted as significant sources of fraud.

"The pay-and-chase model is not the best way to promote payment integrity. Once money goes out the door, it is really challenging to get it back, and so it's really important to set those controls up front," she said.

Looking forward, Miskell said artificial intelligence and emerging technologies, if used responsibly, could become a "game changer when it comes to enabling real-time prevention and detection."

"Just as it can be a really positive thing for government, in terms of more efficiently [and] effectively delivering services, you can also assist fraudsters and nefarious actors in quickly exploiting weaknesses in federal programs and taking advantage of taxpayer dollars in a way that's inappropriate," Miskell said.

"Fraud has always been kind of something that's been out there. But the speed and the magnitude at which it occurs and can occur is really kind of the biggest change."

How graph databases drive a paradigm shift in data platform technology

Federal agencies are awash in data. With recent modernization efforts, including the wide-scale adoption of cloud platforms and applications, it's easier than ever for agencies to receive streaming data on everything from logistics to finances to cybersecurity.

But that volume of data requires new solutions to process and analyze it. Older methods like SQL and NoSQL simply aren't up to the task of analyzing all of the connections between the government's many massive databases.

That's where the new graph paradigm of data platform technology comes in.

"It's adaptable to data where you're interested in the connections between data points. That includes most data warehouses, most traditional databases and includes systems or processes that are naturally networked," said Michael Moore, principal for partner solutions and technology at Neo4j.

"As you load data into a graph, every single data point is paired with all of the logical possible relationships that exist that connect that data point to every other data point where it should be connected that already exists in the graph database."

— Michael Moore, Principal for Partner Solutions and Technology, Neo4j

"There's probably as many use cases as there are different types of databases. But generally where we play is in either systems where there's natural networks, or we're looking at data that is maybe fragmented across organizational silos."

Making the connections across staggering amount of data

It's not unusual, Moore said, for large organizations to have upward of 200,000 databases. With traditional methods of data analysis, it's difficult, if not impossible, to get a global view of that much data, he said. That means it's easy to miss important connections.

For years, the challenge has been the cost of compute. In the late 1970s, when the first database systems were created, 1 megabyte of RAM cost approximately $10,000. Systems designers knew the data needed to be related, but doing it at scale simply wasn't cost effective. They couldn't afford to store the data relationships, Moore said. Their solution was runtime calculations, which are fine as long as there's only a few databases. But running those kinds of queries on a massive number of databases can bring the system down.

"We are doing something fundamentally different. We recognize the primacy of those relationships that connect those data, and we literally store them on disk and in memory. And every single relationship gets its own ID. It's

given a name that can carry or convey semantic information," Moore said.

"That relationship could even have data on it, like it can have a timestamp, or it could have a probability. And as you load data into a graph, every single data point is paired with all of the logical possible relationships that exist that connect that data point to every other data point where it should be connected that already exists in the graph database."

That creates a system where not only the primary records exist, but also all of the records that show how they're related to all the other data in the system.

"So, for example, I can write a query where I say, 'Start out at a single node in the graph and follow a certain type of named relationship and discover for me all of the data that connects to that starting point node.' And that's how our queries essentially run," Moore said.

That allows a user to go deep into a network to identify all the existing relationships or analyze a complex hierarchy of data. That's what makes this approach paradigm shift, Moore said. In traditional databases, the relationships only exist if someone manually interrogates them. In a graph database, those relationships are all stored with their own metadata, meaning they can be queried in seconds over a much broader footprint of data, he explained.

Graph databases offer new analytics possibilities

For example, if an agency wanted to use the graph paradigm to understand network vulnerabilities, they could create a digital twin to do so. So every server would be connected to every open port in the graph. Add the application programming interfaces and their firewall addresses, and now it's a map of how physical assets are networked, Moore said. That allows the agency to delineate the points of entry to its system.

> **"A lot of this pivots on two concepts: trustworthiness and timeliness."**
>
> **— Neo4j's Michael Moore**

After that, it can add the administrators of those machines as well as the users. The agency could even add the applications running on those machines and their degree of sensitivity. At that point, the network relates the user base with the application portfolio, the assets and who's using them, and the points of entry from the outside world.

Those connections let the agency run analyses such as figuring out how many steps are required to get to the most sensitive data or how many users on a single server are over-privileged. The use of the graph database lets the agency design failover strategies if a system goes offline during a critical application, for instance, Moore said. And it allows agency teams to see when its systems are under attack, through which routers an attack is occurring, so that the agency can shut them down.

"A lot of this pivots on two concepts: trustworthiness and timeliness," Moore said. "Trust comes from understanding something in its full context. If I have a piece of information and I want to know where it came from, what's surrounding it. I can do all of that on a graph. And then because the graphs have already connected all the data and copied that up into memory, we can traverse very, very quickly at very low computational cost, large amounts of data. Then that becomes my analytics system of record."

State Department paves way for AI, other emerging tools

BY JORY HECKMAN

The Biden administration is laying the foundation for greater use of artificial intelligence tools across the federal government, but many agencies — including the State Department — are already charting their own paths for how federal employees will use AI.

State has begun implementing AI tools to help its workforce go through a massive inventory of diplomatic cables and recommend documents to declassify. The department is also crafting its first enterprise AI strategy. Giorleny Altamirano Rayo, the department's chief data scientist and AI lead, said the strategy will ensure trustworthy AI is part of State's focus as it builds up its data analytics capabilities.

65%

The percentage reduction in time State has seen in reviewing documents during declassification by implementing AI and natural language processing

SOURCE: Giorleny Altamirano Rayo, Chief Data Scientist, State

Its Center for Analytics, led by Chief Data Officer Matthew Graviss, is developing the enterprise AI strategy. "That's going to guide our implementation of AI in a way that's responsible and that is going to keep the trust in our department on using AI," Rayo said.

The upcoming AI strategy is closely linked to the department's first enterprise data strategy, as well as Secretary of State Antony Blinken's broader plan to modernize U.S. diplomacy. "We basically consider it another tool in our diplomatic toolbox. But we're very mindful of this critical connection between data quality and successful use of AI," Rayo said during a FedInsider webinar.

State AI Priority 1: Ensure trustworthiness

The strategy will focus on how the department can field AI tools in a way that upholds privacy, security, ethics and equity to make these applications trustworthy for the end user, she said.

"Responsibility is the name of the game, and that responsibility is paramount in applications of AI. We build an audit, and we scrutinize our models so we make sure that we're doing it the right way," Rayo said. "We're doing all of this by being mindful of the importance of both policy, governance and strategies that allow us to do this responsibly."

In the lead-up to the AI strategy's release, the Center for Analytics recently wrote a new chapter in the Foreign Affairs manual on the responsible use of AI.

"We basically consider it another tool in our diplomatic toolbox. But we're very mindful of this critical connection between data quality and successful use of AI."

— Giorleny Altamirano Rayo, Chief Data Scientist, State

That chapter sets out the department's principles for using AI and contains an inventory of use cases.

Rayo said the language in the Foreign Affairs manual echoes the Trump administration's December 2020 executive order on how to design, develop and deploy and use AI in a responsible manner across the federal government.

"The first thing that we really wanted to do is make sure that we were following directives and that we're following the values of equity, privacy and respect for civil liberties," Rayo said.

State AI Priority 2: Test drive AI use in real-world applications

As to testing out AI to assist in its declassification work, the department is using machine learning to augment its workforce in declassifying diplomatic cables.

Diplomatic cables at the department remain classified for 25 years. At that point, State reviews the documents to determine whether where they should remain classified or can be fully or partially declassified.

"There was a huge explosion of documents [and] emails around the world. And the State Department just got bombarded with tens of millions and thousands of millions of emails to sift through," Rayo said of the latest tranche of records that is scheduled for review.

The department is using natural language processing to review the documents.

Rayo said the AI tools are reaching the same declassification decision as human reviewers about 97% of the time and have reduced the time to review records by about 65%.

How agencies can upskill in AI to achieve a data mesh model

Artificial intelligence technology has made huge advancements recently, and agencies across government are trying to take advantage of the possibilities it presents.

But organizational behaviors haven't kept up enough for federal agencies to easily be able to scale AI across the enterprise and generate the kind of value they want. The key to accomplishing this, is upskilling at scale, said Doug Bryan, field chief data officer at Dataiku.

Rather than a small but talented group of people owning AI in their own silo, agencies need to decentralize control and get as many people as possible across their organizations using it, Bryan recommended. That will change agencies' operating model to a data mesh behavior.

"One of the biggest challenges is that when you have a central AI team, you have a separation between the subject matter experts and the people who know the data and know how you can generate value from the data. And in a lot of organizations, they don't talk to each other, and they spend years developing AI products that are never used," Bryan said.

"By upskilling frontline workers and making it more decentralized, it brings the subject matter experts together with AI development so that the people who know best what data products are going to generate value are the ones developing them."

AI thrives on collaboration

If this sounds familiar, that's because it's similar to the concept of agile development: Knock down the silos, get the business owners and developers in the same room, and ensure priorities and functionalities align with the business use from the beginning.

Data mesh behavior actually goes a step further. AI has become so easy to use, business owners can actually join in the development alongside the data scientists, Bryan said.

Therein lies the challenge: Upskilling subject matter experts across an entire organization is a big lift. Bryan said the way he's seen it work best is to start with a center of excellence, a small group of people who begin working with business owners across the enterprise, office by office.

They can then prove the value and evangelize it, and then the agency can move to a hub-and-spoke model, where the data scientists are co-developing alongside business owners. As successes pile up, the data scientists can take a step back and allow frontline workers to do the development, governing the new data products on their own.

"One of the biggest challenges is that when you have a central AI team, you have a separation between the subject matter experts and the people who know the data and know how you can generate value from the data."

— Doug Bryan, Field Chief Data Officer, Dataiku

> **"The opportunities in the private sector are big, but the opportunities within agencies are much, much bigger."**
>
> **— Dataiku's Doug Bryan**

"So it's an evolutionary process," Bryan said. "One of the reasons data mesh and adoption of AI has gone so slow is that it takes time. You can't just go out and buy a data mesh. It's an organizational change."

Creating structure for AI to thrive

Once an agency has achieved a data mesh model, he said that central team of data scientists now has two new mandates:

- First, set guidelines for governance around institutional and organizational ethics and values.
- Second, provide an infrastructure and platform that makes it easy for frontline experts to collaborate and develop on.

Some fields, like medicine and defense, are ahead of the game and have already been working toward establishing these guidelines for years. Other fields, like supply chain, human resources and logistics are much newer to the idea and will need to play some catch up, Bryan said.

But the basic idea is to determine what biases may come into play in an AI product, which ones are important and how to mitigate those. For example, an agency using AI for promotions should absolutely care if its tool is more accurate for men than women. But an agency might not care if a supply chain AI capability charged with sourcing screws has a regional bias. It doesn't matter if all the screws come from Texas as long as the agency is getting the best deal.

Meanwhile, the platform has to prioritize ease of use. Despite upskilling and a low barrier to entry for AI, business owners are not developers by trade. They have day jobs, meaning they might only be working on their AI projects a couple of days a month. That means the tools need to be easy to use, and easy to remember if they come back to it after a long period of inactivity. The right platform can drastically improve the productivity of a team, Bryan said, by anywhere from three times to as much as 10 times.

Deriving AI's value to your agency

Data scientists can also help business owners design tests to prove the value of an AI project and how to measure that value. Is it meant to save time? How much time saved is worthwhile? Is it meant to save money? Will that be measured on single transactions or long term? Teams using a new AI tool can be compared to teams not using it, in a classic A/B test scenario, Bryan suggested.

"The opportunities in the private sector are big, but the opportunities within agencies are much, much bigger," he said.

A study by Mitre a few years ago looked into what it would take the Defense Department to be ready for AI by 2025, he said. They determined that 20% of the civilian workforce would need to be upskilled to achieve that milestone.

"That's 150,000 people," Bryan said. "That's bigger than most corporations. And it's a huge, huge opportunity. And if we are going to be ready by 2025, that's pretty much the only way we know how to do it. And the longer we wait, the further we fall behind."

DAU trains 3,000 acquisition employees in push for AI readiness

BY JORY HECKMAN

The Defense Acquisition University is on a mission to upskill the data smarts of more than 3,000 military and civilian professionals across the Army, Navy, Air Force and Marines.

DAU plans to upskill these employees in data analytics and artificial intelligence skills so they can better understand the emerging tech that the Defense Department is buying.

The university offers certification training, elective training and mission assistance work to more than 155,000 members of the Defense acquisition workforce.

David Pearson, director of DAU's Engineering and Technology Center, said data and AI skills training courses are already available to DoD acquisition employees. But the university is taking steps to tailor it courses to employees' specific roles and career trajectories.

"The skills that we hired people for 15 years ago are no longer the skills we're going to be needing to field the systems of our future — that warfighters are going to be depending upon."

— David Pearson, Director, Engineering and Technology Center, Defense Acquisition University

"The skills that we hired people for 15 years ago are no longer the skills we're going to be needing to field the systems of our future — that warfighters are going to be depending upon," Pearson said on a recent episode of Federal News Network's ***All About Data.*** "The emerging technology that's going to be driving the performance of our defense systems that we send out to the field increasingly rely upon those who have the technical skills to properly manage and acquire them in the future."

DAU's upskilling initiative is among the latest efforts within DoD to improve its AI readiness. The department is looking to reach a baseline level of AI readiness by 2025 to stay on top of emerging threats.

Changing how DoD makes decisions

Pearson said these data skills are becoming more valuable for the Defense acquisition workforce and serve as the foundation for data-driven decision-making for DoD leadership.

"There's broad recognition across all of the Department of Defense that we really need to step up our game in the area of data skills. Far too often, decisions at all levels are being made on dated anecdotes or simply the opinion of the senior-most person in the room. We really need to change that," Pearson said.

DAU is partnering with Coursera to offer thousands of online courses from top universities and industry leaders.

"An acquisition workforce member could enroll in a 34-hour course from the University of Michigan on programming and Python for data analytics. Or they could take an AI product management course from

"DAU adds value by teaching students how to apply these data and AI skills to our unique DoD acquisition environment."

— DAU's David Pearson

Duke. We've made this and thousands of other courses available through our partnership with Coursera," Pearson said.

DAU is adding DoD-specific context to the commercial training. The university is also working with the department's Chief Digital and Artificial Intelligence Office on coursework curation, as well zeroing in on the skills and abilities the DoD acquisition workforce will need in the coming years.

"We've got lots of rules, policies and work practices and unique problem sets here in DoD when it comes to using data and AI. DAU adds value by teaching students how to apply these data and AI skills to our unique DoD acquisition environment," Pearson said.

Coursera CEO Jeff Maggioncalda said that curated training based on an employee's role and career trajectory helps cut down on "content chaos" and presents DAU students with the courses most relevant to their responsibilities.

"What most individuals want is a pathway to a better job, better career, better opportunities. And what learning and development is doing is creating those pathways," Maggioncalda said.

Taking 3-phase approach to data upskilling

DAU is looking to upskill the defense acquisition workforce in three phrases. The university's first step is to promote awareness training and to make more personnel aware of the tools and technology that are reshaping their work.

From there, Pearson said the university is looking to build general data literacy across the workforce — helping employees learn how to make data-informed decisions within the context of their jobs.

For more data-intensive fields, Pearson said the university is getting students to apply their newfound knowledge on challenges they'd see during a usual workday.

DoD acquisition personnel see the need for continuous learning to stay up to date on the latest technology.

"We've seen that the people working in the tech space really recognize themselves that in order for them to stay competitive and stay relevant in their particular discipline, they have to be committed to a continuum of continuous improvement and skills," Pearson said.

DAU is also taking a data-driven approach to retooling its coursework. The university is looking at data to determine what courses to build, how to improve them based on student feedback and when to retire a course.

"Today, we're using some very fundamental skills to collect and analyze the data. … But looking ahead, we're excited about more fully instrumenting our courseware," he said. "Rather than relying solely upon subjective student survey data, we want to document student behaviors and how they're interacting particularly with our online courses. We can use this information to make the targeted improvements we need to our courseware, further advancing our mission."

Maggioncalda said Coursera is helping DoD shift training away from an entirely traditional classroom setting and make more of its training available online.

"Especially if you're deployed or you're moving around, it's really hard to have a purely place-based educational system that's going to be flexible enough to meet those kinds of demands, so online is a key part of it," he said.

How agencies can build a data foundation for generative AI

CLOUDERA

Generative artificial intelligence tools are making waves in the technology world, most famously ChatGPT. Although the code of these tools is significant, their real power stems from the data they are trained on.

Gathering and correctly formatting the data, then transforming it to yield accurate predictions, often represents the most challenging aspect of developing these tools said Nasheb Ismaily, principal solutions engineer at Cloudera.

Federal agencies that want to start leveraging generative AI already have massive amounts of data on which to train the technology. But to successfully implement these tools, they need to ensure the quality of their data before trusting any decisions they might make, Ismaily pointed out.

He offered a pair of examples.

ChatGPT was trained on vast amounts of data sourced from the internet. If an agency released new regulations on protocols related to money laundering, for example, a financial institution would have to review its policies and procedures to ensure it's in compliance. To do so, it could ask ChatGPT. However, ChatGPT would have no answer to that question because that information isn't readily available on the internet, and it wouldn't be part of its dataset.

"Running computations on petabytes of data requires hundreds of thousands of servers operating in parallel. Thus, agencies must seek platforms that allow data storage and processing in a distributed fashion while upholding rigorous security and governance."

— Nasheb Ismaily, Principal Solutions Engineer, Cloudera

But if a federal health care agency wanted to create a generative AI that patients could consult as a kind of middle ground between searching on WebMD and actually visiting a doctor, it would possess the necessary raw patient data to train that AI model. Such an AI tool could emulate a healthcare provider, offering feedback to help patients more accurately assess the severity of their symptoms.

Beyond data gathering

"To train these generative models, it's not merely about collecting data. The data must be in a specific format. It requires thorough cleaning, transformation and enrichment. The process is highly complex," Ismaily said.

"To achieve this, substantial computing power, in the form of distributed computation, is essential. This can't be done on a single server or just a virtual machine. Running computations on petabytes of data requires hundreds of thousands of servers operating in parallel. Thus, agencies must seek platforms that allow data storage and processing in a distributed fashion while upholding rigorous security and governance."

Such security and governance are crucial because not all data should be available to the AI model. For instance, in the health care example, if the AI model was trained on raw patient data, it would also include personally identifiable information.

"The efficacy of the models is dependent on the quality of the training data. Training on outdated data could yield results that are either not meaningful or erroneous."

— Cloudera's Nasheb Ismaily

And a fraudster could figure out how to query that data from the AI, Ismaily said.

All PII must be removed before training the AI model on that dataset. The implications could be even more serious in a generative AI tool used for defense or intelligence purposes.

Therefore, agencies require a centralized security framework that oversees the data, he said.

Platforms for generative AI models also need to be scalable; agencies simply don't have the resources required to crunch that kind of data. Often, agencies might find a shortage of graphics processing units. That's why the platform should be scalable in the cloud. The cloud provides agencies with the computational resources needed to run analytics at this scale without any issues.

Finally, platforms for generative AI models need to foster collaboration.

"We often discuss data storage and processing, but building the models is equally crucial," Ismaily said. "Model building typically uses libraries like TensorFlow or OpenAI. Hence, agencies need a platform compatible with these leading libraries. Additionally, the platform should facilitate collaboration among data scientists, engineers and analysts to design, train and deploy models."

This allows agencies to centralize the platform and the data, knocking down silos so that employees have access to whatever they need. But it also decentralizes the actual building of the models, so business owners can work with those

data scientists, engineers and analysts to build AI models that align more closely with business and mission needs.

Taking that first step toward generative AI

Therefore, the initial step for any agency aiming to use generative AI should be the adoption of a data lake. Agencies should retain all data. What appears as noise today might emerge as a valuable signal tomorrow, Ismaily. Agencies need to understand their source systems, their data, their different silos and the teams using them and bring them all together to build advanced AI learning models.

"Data governance is pivotal. In discussing data governance, it's essential to consider not only the metadata but also the data's lineage. Questions like, 'Where did the data originate? How was it transformed? Who accessed it? Has there been any malicious alteration? Is it the most recent data?' are crucial," Ismaily said. "Undoubtedly, the efficacy of the models is dependent on the quality of the training data. Training on outdated data could yield results that are either not meaningful or erroneous, potentially leading an agency to base decisions on outdated or inaccurate information."

Data strategy identifies how IC agencies intend to use AI to their competitive advantage

BY JORY HECKMAN AND JUSTIN DOUBLEDAY

The intelligence community is setting a two-year roadmap for its workforce to become more familiar with data and artificial intelligence tools — and is already charting progress toward those goals.

The 2023-2025 IC Data Strategy lays out the steps all 18 intelligence agencies will take to develop a more data-savvy workforce and set the groundwork for the IC to use AI tools. The strategy states the IC crafted the strategy so it could stay ahead of a "new period of strategic competition."

"It is no longer just about the volume of data, it is about who can collect, access, exploit and gain actionable insight the fastest, as they will have the decision and intelligence advantage," the report notes.

"There's a data acumen and literacy that we have to bring every single IC officer up to. … No matter where you are, you're going to touch and work with data."

— Lori Wade, Chief Data Officer, Intelligence Community

Lori Wade, the Intelligence Community's chief data officer, said in an interview that the 11-page strategy spends little time on background, but focuses on implementation of near-term goals.

"We have two years to really get focused on some of the foundational areas of end-to-end data management," Wade said in a joint interview for Federal News Network's ***Inside the IC*** and ***All About Data***.

"Data is fundamental to everything that we do in the intelligence community, and our ability to manage it properly — and to maintain how we do data across our entire lifecycle — is an important part of where we're going to move the needle forward, if you will, for the intelligence community."

The IC CDO Council in late summer reviewed the second-quarter results of the data strategy's one-year action plan. The council serves as a forum for component agencies to collaborate on shared solutions, as well as work together on shared challenges.

"We're opening up the space, where they take a step back and do a collective move forward on either challenges, build on accomplishments or work together as we go forward," Wade said.

IC strategy emphasizes 4 AI readiness goals

The data strategy outlines four focus areas:

- Perform end-to-end data management
- Deliver data interoperability and analytics at speed and scale
- Advance all partnerships for continued digital and data innovation
- Transform the IC workforce to be data-driven

"To date, we have not significantly prioritized data as a strategic and operational IC asset. The central challenge remains that the IC is not fielding data, analytics and AI-enabled capabilities at the pace and scale required to preserve our decision and intelligence advantage," the report states.

To ensure the intelligence community has the skills it needs to respond to emerging threats, the strategy elevates the importance of upskilling the current IC workforce on data skills while also recruiting new hires with these in-demand skills.

Wade said the IC data strategy reflects the need for data professionals and analysts to keep their skills sharp through continuous training and "evolving their data tradecraft."

But the entire IC workforce, she added, will need to have a baseline level of data literacy.

"There's a data acumen and literacy that we have to bring every single IC officer up to — whether they're leading the agency, working on the legal side [or] the acquisition side. No matter where you are, you're going to touch and work with data, whether it be our business data or mission data. So we need to understand, what does that mean, and how does that look?" Wade said.

CDOs are actively evaluating the level of data literacy that exists today across the Intelligence Community workforce to understand potential gaps and training requirements.

"How do we embed some element of data into every module that's for entry on duty for anyone coming into their agency or to the IC?" Wade said.

Working on real-world IC challenges

The intel community is also looking to upskill its workforce through its Public-Private Talent Exchange. PPTE gives IC personnel an opportunity to develop skills and expertise from industry partners on the frontlines of technology breakthroughs.

Wade said that, as part of the PPTE program, her office is bringing academia and IC components together on a data-focused mission sprint that will focus on real-world applications of data.

"We're going to use a real mission example, and we're going to bring in officers from the IC to work with individuals and experts from the private sector and from an academic organization to really dive in and solve a real mission problem," she said.

The IC workforce now spans five generations, but as intelligence agencies bring in Gen Z talent, Wade said the IC needs to make full use of these new hires' specific skill sets and expertise.

"We need to make sure that everything that we're doing across the organization will take full advantage of what they're bringing to the table — which is, they're digital natives," she said. "And we need to make sure that we've got everyone else who's already in the Intelligence Community up to that kind of understanding, so that we can work together as one IC, as we go forward with the same digital and data literacy."

Laying that AI groundwork

Wade said AI and automation tools serve as the foundation for data-driven decision-making because the volume of data IC agencies produce far exceeds what its workforce can process manually.

"Today, people aren't understanding the volumes of data — that they no longer can just even go through it on their own. We have technology and capabilities that we can bring to help us to do that in ways that we haven't in the past. We need to take full advantage of that, but we need to be ready ourselves," she said.

AI is something that requires quality data — highly curated data or data that has to be tagged and labeled. It has to be discoverable and accessible. We have to have a data architecture in place. So we're working on all of that."

— IC's Lori Wade

The strategy lays out a goal to establish end-to-end data management plans from the moment data is collected or acquired through its exploitation, dissemination and ultimate disposition.

The goal is underpinned by a new IC data management directive that ensures all data that's collected — whether open source, commercial or classified — has a data management plan, Wade said.

A shared approach to data management

She noted the successful adoption of AI will require the deliberate management of data.

"AI is something that requires quality data — highly curated data or data that has to be tagged and labeled," Wade said. "It has to be discoverable and accessible. We have to have a data architecture in place. So we're working on all of that."

The Office of the Director of National Intelligence is also developing a common IC data catalog to help create inventories of data across intelligence agencies with shared standards and metadata.

"Each agency can have their own catalog, but they need to be able to then connect it to the larger IC data

catalog," she said. "We see that as a way to drive the data management and the best practices. Because if you're putting something in a catalog, you're tagging it, you've labeled things."

And the strategy further prioritizes interoperability of data standards in and out of the Intelligence Community. Wade said the IC is partnering with the Defense Department as it builds out its own data strategy.

"That's how we're going to get to speed and scale … making sure that we're following a set of common standards, that we have that infrastructure where we're sharing capability and that we are looking and doing that end to end," she said.

To ensure the IC is tapped into the latest technology developments, ODNI wants to lower the barriers to collaboration with industry partners through its Front Door access program.

Wade said she also recently met with Army Futures Command and industry partners in Austin, Texas, to better understand which emerging technologies the IC needs to focus on and how those tools might impact the data strategy and its second-year action plan.

These programs focus on reducing the barriers of entry for companies that are working on some of these emerging technologies — whether it be AI, Web3 or immersive technologies like the metaverse.

"If this is the place, and the platforms and the technologies where all social interaction will occur, what does that mean for national security?" she said.

How to democratize data as a catalyst for effective decision-making

alteryx

One of the key best practices in the Office of Management and Budget's Federal Data Strategy calls for using data to guide decision-making. But that's easier said than done when the ability to analyze the data, much less access it, is limited to an agency's often overworked and understaffed data science specialists.

But now that every line of federal business has their own data silo and a mandate to use that data to guide decisions, agencies need a way to democratize access to that data and empower every federal employee to become an analyst, said Kevin Woo, director of federal sales at Alteryx.

"What we've seen is when data silos are removed, organizations are experiencing transformational breakthroughs," Woo said. "The goal is to enable, empower and upskill analysts, who may not have a coding background but are subject matter experts on the data. We help analysts make informed decisions by streamlining and simplifying various data-related tasks. Once those workflows are built, we schedule and automate them through a code-free, drag-and-drop interface."

Connecting the data dots

For example, at the General Services Administration, Alteryx is helping democratize human resources data to better predict employee churn. In other words, GSA is trying to determine in a data-driven way which employees are most likely to want to leave the organization in the near future and why, Woo said.

At the end of every year, and at the end of their employment, every employee of GSA is given a survey of 10 to 20 questions. That survey touches on things like drive time to the office, relationships with managers and coworkers, and pay and benefits. The data from those answers is then ingested to determine which aspects of their jobs are most likely to make employees want to either stay or leave. Then predictive modeling analytics and machine learning identifies other employees, based on that data, who might be likely to consider leaving as well.

At the other end of the HR lifecycle, the Marine Corps is using Alteryx's platform to improve recruiting processes. When a potential recruit wants to join the Marine Corps, they're given an exam. If they pass the exam the first time, the money to administer the exam comes from Congress. But if recruits fail the exam the first time, the money comes from the Marine Corps' direct budget. So the data is used not only to

"What we've seen is when data silos are removed, organizations are experiencing transformational breakthroughs."

— Kevin Woo, Director of Federal Sales, Alteryx

maximize the likelihood of finding better recruits but also to maximize the service's financial investment.

"It first starts with us being completely agnostic, so that no matter where your data lies, we can ingest it from anywhere, anytime, anyplace. And also it doesn't matter how many data sources it's coming from," Woo said. "A workflow may be as simple as cleaning a specific Excel file or as complex as cleaning and joining 20 different data sources, all in an unstructured or structured format, and joining that all together in an automated way."

Preparing data leads to ROI

Woo said that on average, analysts spend around 70% of their time cleaning, prepping and blending data. His goal, he said, is to get the other 30% spent actually analyzing, up to 50% or even 70%. That's when people begin to be able to innovate and make business impact decisions.

For example, analysts use the platform to flag anomalies for fraud, waste and abuse investigations. In fact, using this method, several inspectors general office can identify outliers quickly, Woo said. The OIGs are utilizing the platform to automate their auditing processes as well as fight fraudulent health care claims. The speed to insight allows OIG investigators to process investigations quicker, he said.

In another situation, a federal agency was able to take a 300-page PDF phone bill, extract the data from it using text mining and optical character recognition and convert that data into an Excel file that was much easier to work with. It also works in the other direction as well, Woo said.

"The goal is to democratize analytics and put analytics in the hands of everyone, regardless of your background."

— Alteryx's Kevin Woo

Alteryx just recently added both an image-to-text tool and a summary-to-text tool, enabling one agency to generate summaries of open source intelligence documents that would take a human analyst months just to read through.

Alteryx has also been used by the Census bureau to monitor the health of the U.S. construction industry. It's used by the U.S. Patent and Trademark Office to forecast patent fees and flag potential instances of patent and trademark fraud. It's used by the Federal Aviation Administration to help manage its fleet of aircraft. And it's been used by the Department of Health and Human Services to identify vulnerable populations to deliver relief for both the opioid crisis and COVID-19.

"Step one is really identifying a business or data problem. With the Alteryx platform, we bring the analytics to the data via code-free, drag-and-drop tools. The golden message is versatility. So no matter if you sit in HR, finance, data analytics, fleet management, geospatial or supply chain, we provide a collaborative platform to share workflows across the enterprise," Woo said. "The goal is to democratize analytics and put analytics in the hands of everyone, regardless of your background."