Creating an Intelligent Government With Data

Executive Summary

Imagine a world where government solves our biggest problems with evidence. In that world, agencies deliver on their missions to provide, protect and prosper – and there's a strong trust between citizens and government.

Some might consider this a dream. But it doesn't have to be.

In fact, in many places in government today, it is already a reality.

It might seem as if there are large obstacles in the way of becoming more data-driven and intelligent in government. But there are solutions. There are ways to combat the data silos across your organization. You can mitigate the issues with your legacy systems. Your aging workforce can become an asset you leverage on the way to fulfilling your data-driven dreams.

But in order to do this, governments can and must adopt a data-driven culture to increase evidence-based policy and program decisions. Governments at the federal, state and local levels need to adopt new services models, and become service orchestrators and information-brokers, rather than direct service providers.

To get there, governments will need to share data across agencies, embrace emerging technologies and work directly with their constituents to rebuild trust and place citizens and their needs at the center of their efforts.

In **Creating an Intelligent Government With Data**, we explain how leading governments can focus on integrating data across departments to turn it into actionable information for analytics-based, transparent and accountable decisions.

We'll look at strategic priorities necessary for government workers to transform into data-driven problem-solvers. Experts in government will share their stories of how they are leveraging data analytics and intelligence to create evidence-based programs and policies that serve their communities. And we'll offer up insights into tools and resources for how your agency can get there.

Today, government must work to be more proactive, foresighted and automated. It must be data-driven and citizen-focused. And it can be done. Let us show you the way.

Data & Intelligent Government: At a Glance

What impact do data and digital intelligence have on government? How do they help you achieve your agency's mission, and where did it evolve from? These stats will help set the context for why creating a data-driven intelligence enterprise is more important than ever.

$3.5 trillion

The world's governments could save $3.5 trillion per year by 2021 if they match the productivity gains that leading countries have made in four functions, one of which is digital technology and data analytics.

$1.2 trillion

$1.2 trillion: the amount of Internet-of-Things (IoT) spending that will take place by 2022.

57%

There will be a 57% increase, on average, of the contribution of machines and algorithms to specific tasks by 2022.

40%

By 2019, 40% of digital transformation initiatives will use AI services.

50%

By 2022, 50% of servers will encrypt data at rest and in motion. Over 50% of security alerts will be handled by AI-powered automation, and 150 million people will have blockchain-based digital identities.

90%

90%: The amount of all digital data in the world that was created between 2015 and 2017. Only 1 percent of that data has been analyzed.

27%

Just 27% of U.S. citizens were satisfied with the level and quality of digital services provided by their state governments.

461

Analytics was listed among the top priorities deemed crucial for achieving agency missions in a survey of 461 government CIOs.

> **"Many leaders come to office with little experience actually managing complex organizations... No enterprise sits on more data than government, or uses it less effectively."**
>
> – Mitch Daniels, President of Purdue University and former Indiana Governor

The Why and How of Intelligent Government & Data

Intelligence is the ability to learn from experience, anticipate problems and use knowledge to adapt to new situations.

But it's not that easy to achieve. Today, even well-managed governments struggle to envision how they can run more efficiently and effectively, leveraging their own intelligence as a resource. Challenges like silos, culture, resourcing, staff and more are difficult to overcome.

Despite these hurdles, however, government's data has the potential for tremendous, life-changing insight, and must be leveraged.

So how can we help government answer these challenges and become an intelligent government?

The answer lies in a variety of tactics, including putting the citizen at the center; radically simplifying complicated processes for the citizen; providing personalized, self-managed online services for guiding citizens; and better data leveraging.

Let's take a look.

Citizen-centric

What does it mean to be a citizen-centric government that is driven by data to make intelligent, evidence-based decisions?

It starts with putting the citizen's point of view at the center to deliver on policy mandates.

So where do you begin? Governments must work to understand the core citizen needs across departments before trying to solve the departmental issue of the day. It means understanding the interaction between government and a business or citizen and the process from their point of view.

Your agency can start obtaining a citizen view by interviewing citizens or businesses individually or involving a small group in a design session. This will help you design better processes or services with the constituent experience in mind.

Think about your wide-ranging groups of users, and consider what will simplify life and offer a more enjoyable user experience for your citizens, employees or government employees.

Ultimately, governments that work to become citizen-centric will simplify complicated processes and provide more personalized, self-managed services for citizens on all channels. Intelligent technologies with conversational user interfaces will be employed for better delivery of services. Agencies will become service orchestrators and information-brokers, and will deliver end-to-end customer journeys across departments.

Putting the citizen's point of view at the center of every decision is key for success in the digital age. This does not stop in the citizen-facing departments, but also applies to enterprise-level decision-making across program delivery, from public safety to infrastructure improvements.
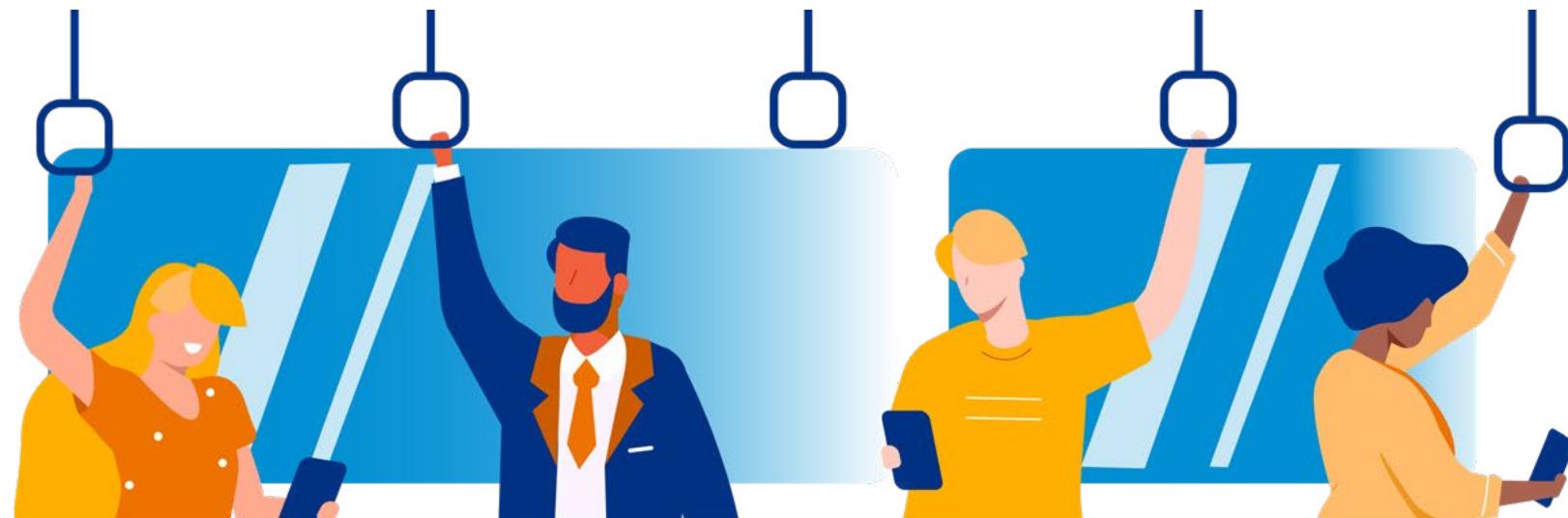
Radically simplifying complicated processes for the citizen

After having focused on taking the point of the view of the citizen, governments must next focus on updating processes and business flows to match the needs of the citizens and the services they want.

Radically simplifying complicated processes for the citizen means providing personalized, self-managed, secure online engagement. But to do this, and do it well, governments must be taking advantage of data and technology.

New digital capabilities can provide personalized, self-managed and insightful online services guiding citizens through the jungle of possible transactions, giving individual recommendations and delivering services proactively.

Further, governments can issue a secure online identification for citizens that bridges the silos between agencies without resorting to a single, central database of personal information.

Savings from optimized processes and reduced legacy system maintenance will help agencies engage citizens in new ways and build the organization in the way they want.

Providing personalized, self-managed online services for guiding citizens

As discussed, within the next decade, leading governments will work to simplify complicated processes and provide more personalized, self-managed services for citizens on all channels.

But this means that governments must embrace emerging technologies to achieve this vision. Governments must adopt machine learning, conversational user interfaces and natural-language processing to simplify their processes and to start to provide personalized service.

One by-product of this approach: With automation and personalization of core services, government employees will be free to focus on the more complex services needs of citizens.

With this capability in place, the organization can begin delivering services proactively without compromising privacy and permission, rather than expecting the citizen to request services.

And government organizations can use two-way authentication, encryption and blockchain technology to enable constituents to approve the use of their personal data.

This will lead the way toward the self-managed online services for citizens that will provide seamless interactions.

Better data-leveraging

Finally, in order to achieve all of the above – becoming citizen-centric, simplifying complicated processes and providing personalized, self-managed services – government must, critically, better leverage its data.

In order to do this, governments must integrate operating and experience data from internal and external sources to create a baseline set of facts that informs their decision-making. And they must also make the data available to constituents to build trust and foster a more fluid give-and-take of data.

That means that governments must begin by sharing data across their own agencies to develop an integrated picture.

Currently, the silos that bottle up data are perhaps the biggest barrier to meeting the proposed vision. Once these silos have been broken down, however, agencies will be able to share data and use predictive and simulation technologies to improve strategic planning and policy-making.

In short, success will be dependent on creating a culture that is open and transparent, one that values evidence over intuition and is based on an organization-wide "single source of truth" that integrates interorganizational and external data.

3 Ways to Better Leverage Data at Your Agency

Integrate your diverse data sources. Data is the currency of digital transformation. Yet within most public sector organizations, data is scattered among multiple applications, files, data warehouses, data lakes, and public and private clouds.

Integrate your diverse data. Your data comes to you structured, semi-structured and unstructured. It may be spatial, chart, numeric, geographic, time series, relational or JavaScript Object Notation (JSON), for example. Integrating these different types of data is extremely complex. Yet it's a prerequisite for becoming an intelligent enterprise.

Simplify your data landscape. Today, public sector organizations often lack a 360-degree view of their data and data landscape. With different databases and apps to support the organization, centralized solutions are not being used to manage it all. Intelligent public sector organizations use process automation and a centralized, easy-to-use platform and interface to simplify access to data so stakeholders at all levels can participate with data specialists in the development of creative initiatives and solutions.

The Tools and Technologies You Need to Become an Intelligent, Data-Driven Government

By moving to a holistic platform and suite of intelligent business applications that use intelligent technologies and can be extended on a digital platform, government can truly deliver on the promise of data to make the world a better place.

Here are some other key technologies that the intelligent government must learn to leverage in its journey:

Artificial Intelligence and Machine Learning

Agencies can leverage machine learning to eliminate repetitive manual tasks for social services and immigration applications by automatically determining classifications, routing and responses. Machine learning can also identify government fraud, waste and abuse using historical and real-time data to uncover previously unseen correlations.

The Internet of Things

Connectivity, coupled with machine learning, can analyze data to manage and evaluate infrastructure, assets, traffic and the environment. Remote condition monitoring provides real-time data from public infrastructure to predict maintenance needs. Data from sensors can help the government track water containment to reduce flooding, monitor soil for landslide risk and help track endangered wildlife.

Advanced Analytics

Embedded analytics can provide real-time visibility into changing environments, simulate the impact to solve policy issues and maximize the benefit of scarce public funds for everything from emergency management, transportation, crime prevention and tax compliance to cybersecurity, emergency response and public infrastructure.

Blockchain

Blockchain is based on distributed ledger technology, which securely records information across a peer-to-peer network. It creates a chain of unalterable transactional data that can secure almost anything of value, including land titles, constituent payments, voting records, business licenses and customs manifests. In addition, blockchain can detect data tampering for specific transactions. An attacker will not be able to piece together the transaction since it is dispersed among multiple ledgers and is encrypted.

A Data Platform to Manage Experiences

Experience management platforms enable agencies to understand what citizens feel, think and do every time they interact with government. This technology allows organizations to combine operational performance data from their systems with experience data from citizens and employees to get an accurate picture of each citizen's experience.

Analytics for Efficiency and Effectiveness in North Carolina

Part of North Carolina's Department of Information Technology, the Government Data Analytics Center (GDAC) works with individual agencies and creates statewide strategies to drive data-based decision-making.

To better understand state data, GDAC created the Data Asset Catalog Service to collect business and technical metadata about the state's critical data assets.

GovLoop recently spoke with John Correllus, Deputy State Chief Information Officer and Chief Data Officer, to learn how the state is embracing analytics to become more effective and efficient.

This interview was lightly edited for length and clarity.

GOVLOOP: We often hear about people who are working to make data-driven decisions, or better data-driven decisions, but that they can't get past the silo issue of data. Is that something you've encountered, and how have you addressed that?

CORRELLUS: So we definitely have encountered that. But I think we're encountering it less and less as we've matured as the data organization. But what I would say is it's really about a culture change. One of the ways we've overcome some of the data silos is to be able to show value of data sharing. When you think about data silos, it's really overcoming this inability to share data across the enterprise. Government doesn't collect data to collect data. We're collecting and analyzing data to improve services to our citizens. And so what we're trying to do is integrate data and show the value. And as we integrate data, we're also thinking about the success of services across just not one organization, but rather the collective impact of those services across the continuum. So in trying to understand and showing the value of how various departments use data, and integrating data to show you the success of our collective services to our citizens, helps break down those silos.

Are there particular projects in which you could talk about how data is supporting these efforts to better serve citizens?

The most notable is how we've integrated criminal justice data and offender information – it's an example of how data supports citizens, and protects them, and that's really valuable. So we have a product called CJLEADS, which is the Criminal Justice Law Enforcement Automated Data Services. It gives you a single view of an offender. This came about 10 years ago, when the state was doing a data integration plan, and right as the data integration was completed, there were two really high profile murders at university, in close proximity to each other, about 20 miles from each other. And that highlighted the need for the ability to improve our integration of this offender data so you could actually have a single view of offender, rather than go into a bunch of systems. We're talking about a data service that surfaced as a single view for officers and other criminal justice professionals. And the big part of it is advanced algorithms, and in fact the new resolutions help reconcile data to determine if an offender may be lying. So having advanced tools and analytic support for professionals to protect citizens is pretty important. And that's used at this point by over 25,000 criminal justice professionals statewide.

Were there steps you've taken in your data journey that you would share with other organizations looking to do similar initiatives?

How you become a data-driven organization is less about being technical and more about demonstrating the value of that data, and demonstrating the value of integrating that data. For an organization thinking about investing in data strategies and data organization, you have to work toward something that's meaningful and important and impactful. You don't want to just do data for data's sake. You have to have a value statement, and you have to start with a business problem.

I used CJLEADS as a good example. We started with a business problem and really asked critical questions -- almost policy questions really; what's happening, who is it impacting, why did it happen; what will happen and how can we change. And then we thought about the importance of data in each of those questions.

Next, I'd say to think about what data you could integrate to help with those questions. And then tie that back to the that investment into that data or those data strategies back to outcome. Ask yourself, how can you use data to improve citizen safety? How can you

use that data to improve health outcomes? How can you use that data to improve financial compliance? How can you use that data to improve longitudinal performance, which really is about education, workforce, early childhood, and more?

But those are the domain areas that any state government is trying to improve. And the way they're going be able to improve is to use that data to improve that service.

SAP
Q&A

HOW DATA DRIVES DIGITAL TRANSFORMATION

Chris Atkins serves as Vice President for Digital Government Transformation at SAP Public Sector. At SAP, Chris leads SAP Public Sector's strategy surrounding data driven government. He serves as SAP Public Sector's thought leadership and innovation capabilities to customers around the world.

Chris brings nearly fifteen years of public sector industry expertise to SAP. Chris' last public sector served as Director of the Indiana Office of Management and Budget from 2013-2015. As OMB Director, Chris served as the chief financial officer for the State of Indiana and was the chief executive sponsor of Indiana's MPH initiative to leverage innovative technology to solve pressing public policy problems.

Chris Atkins, Vice President, Digital Government Transformation, SAP

Q You were part of the team that helped propel Indiana as a leader in the strategic use of data. What did you achieve with sophisticated analytics technology that you wouldn't have been able to otherwise?

We had persistent — and life-changing — problems we wanted to solve like lowering our infant mortality rate or helping people with opioid use disorder. Well-intentioned people had been trying to solve these issues for a long time. The effort was there, but government has historically been organized in service delivery silos, and separate agencies alone didn't have the resources to tackle these issues.

With analytics technology, we built a platform to sit on top of those silos and provide the data resources that agencies need to gain insight into problems and make those insights actionable. It allowed us to redefine our approach and better collaborate to overcome challenges.

Q What has changed with analytics technology in the last five years and what do you see as some the biggest opportunities?

The biggest change is the augmented intelligence government employees will have when government agencies deploy emerging technologies like artificial intelligence (AI) across business applications.

People can fear AI because they anticipate it replacing human employees. But I believe the opportunity lies in augmenting the intelligence that our hardworking state and local government employees bring to the job every day. For example, AI can help government human resources (HR) experts focus their time on creating a great workplace culture by automating routine and time-consuming tasks like resume matching.

Q How can government agencies use SAP to accelerate digital transformation?

SAP crafts industry-specific solutions and speaks the language of government when we talk with our public sector customers. For example, we have a public-sector specific analytics solution called Digital Cabinet Room that helps government executives gain the real-time insight they need to manage strategy and public policy development in their day-to-day operations.

We also co-innovate with our customers to enable digital transformation. We help our government customers take a platform approach that accelerates the optimization and transformation of their business processes using the power of data analytics insights. Co-innovation with our customers helps us push the envelope of what is possible.

Q Are there best practices government should adopt moving forward to effectively embrace technologies like data analytics?

First, be relentlessly focused on outcomes. In Indiana, we got so much traction because we were relentlessly focused on infant mortality, and then on opioid use disorder. One of our customers at SAP — the Office of State Revenue of Queensland, Australia — used a data-driven approach to engage more uniquely and empathetically with their taxpayers to help them avoid debt. We are also working with customers on how to use data strategically to reduce recidivism and homelessness.

Technology is a strategy to help you achieve a business outcome — focus on those outcomes.

Second, invest in new skills. This includes new technology skills like data and database management skills, analytics and insight skills, data science skills, enterprise architecture skills. Investing in these types of skills long term is going to be vital for any government that doesn't want to be left behind. On top of technology skills, as government becomes more data-driven, it will be critical for leaders to acquire legal expertise around data governance.

Helping the Government Become More Data-Driven

An interview with Chris Atkins, Vice President, Digital Government Transformation, SAP Public Sector

In this moment, many things are accelerating at a strikingly fast rate – technology, world events, and more. But at the same time, the core mission of the public sector – to protect the community, provide services, and help the economy prosper – remains firmly in place. Agencies must learn to keep up with the changing world around them while still ensuring citizens get the services that help make their lives better.

But how? The answer lies in making data and business intelligence a strategic priority and a valuable asset. Agencies must invest in emerging technology with a focus on open, standards-based technologies and data analytics that support this strategy.

GovLoop sat down with Chris Atkins, Vice President, Digital Government Transformation, SAP Public Sector to learn more. SAP is a leader in supporting public sector organizations to become intelligent agencies through data and technology.

Today, Atkins said, it's more important than ever for government realize it has a three-fold purpose: to provide, protect and prosper.

"In order to fully deliver on this purpose, government now has to leverage its own data as an asset – understanding its data could hold the key to solving some of society's biggest challenges like drug abuse or environmental sustainability," Atkins said.

SAP can help. "We have four decades of end-to-end experience in business processes with intelligent technologies and platform needed to drive data-driven innovation that can be deployed directly into government processes," Atkins said. "We also have a breadth of industry knowledge and a public sector portfolio that fits government's unique needs – and a proven record of success with our government customers across the globe."

"Government must understand that data can hold the key to solving some of society's biggest challenges, like drug abuse or environmental sustainability. In leveraging this data, our belief is that government will transform to provide new services, and to meet citizen expectations."

In one use case, Indiana leveraged its data and turned to SAP to tackle a critical crisis – opioid overdoses. Indiana MPH staff are tackling the issue using crime lab drug data from across the state from to see new correlations in drug use over time and find insight into crime. The MPH uses the SAP® HANA platform together with SAP Predictive Analytics® software to gain a 360-degree view of the problem and approach it in new and innovative ways. By quickly aggregating and analyzing data, the state is able to visualize the problem and influence change that will save lives.

"In leveraging data, our belief at SAP is that government will transform to provide new services, and to meet citizen expectations," Atkins said.

Takeaway: Government has a three-fold purpose: to provide, protect and prosper. To deliver on this purpose, government now has to leverage its own data as its most valuable asset.
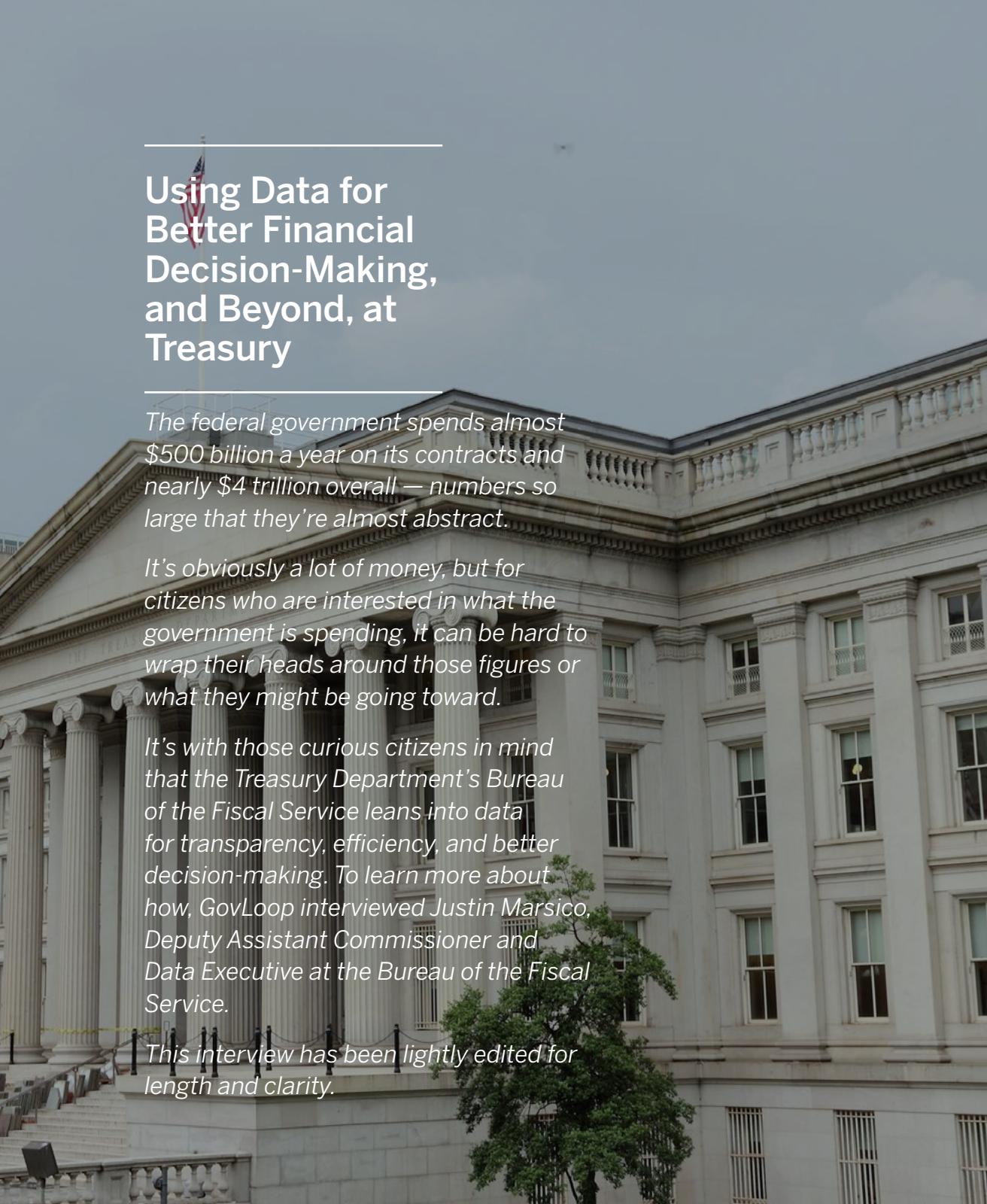
Using Data for Better Financial Decision-Making, and Beyond, at Treasury

The federal government spends almost $500 billion a year on its contracts and nearly $4 trillion overall — numbers so large that they're almost abstract.

It's obviously a lot of money, but for citizens who are interested in what the government is spending, it can be hard to wrap their heads around those figures or what they might be going toward.

It's with those curious citizens in mind that the Treasury Department's Bureau of the Fiscal Service leans into data for transparency, efficiency, and better decision-making. To learn more about how, GovLoop interviewed Justin Marsico, Deputy Assistant Commissioner and Data Executive at the Bureau of the Fiscal Service.

This interview has been lightly edited for length and clarity.

GOVLOOP: How are you using data and analytics to guide decisions at the Bureau? Do you have examples of how data supports the mission of your agency?

MARSICO: So, when I think about data and Treasury, the first thing that comes to mind is the fact that Treasury sits in some ways in the center of the federal government, because we're the financial managers for the rest of the government. And at the heart of that financial management activity is data. Every piece of information that is made about an agency's spending, whether it's contracts, grants, or, or spending money out of their salary and expense accounts -- all of those decisions are driven by data that's kept at the agency and verified at, at Treasury.

And, so from the most simple and straightforward way possible, to us, data is the thing that allows us to know that we can pay our employees, or we can pay our contractors, or we can afford to keep the lights on here at the agency. So data allows us this very basic level function of financial service that Treasury provides for agencies around the government. That's our mission, and that mission rests on the concept of having sound, reliable data that reflects the truth to the best extent that we can.

The kind of next level up from that is, when we start thinking about all of that data that exists, and the ways that we've used it historically, to answer those kind of initial level questions that we want to have answered, like, "Can we afford to do X, can we afford to do Y?" – well, because we're collecting that data, we have the opportunity to use that data to be more strategic, and make more strategic decisions.

And in a nutshell, that's the direction that the Treasury is hoping to lead the financial management community over the next decade. We want to move away from the kind of rote reporting or simplistic use of data, to a more strategic approach using data.

What might that look like? How does the data enable Treasury to make better decisions to better serve citizens?

So if you are a CFO in an agency, and you want to figure out how you can reduce cost by more efficiently making use of contracts, or by getting a better deal on your fleet of vehicles, if you're not focused on just processing day to day transactions and understanding the impact of those no your system, you step back a little bit and, and look at those more strategic questions and do analytical work to determine whether

you're really getting the best value for the government out of whatever contracts you're managing, or whether you're using the resources that you have.

And what we're trying to do is to create space for agencies to ask and to be able to answer those questions by taking away some of the more mundane and rote functions that, that CFOs tend to focus on. And what we're trying to do over here in my team, is to look around the Fiscal Service at all of the data that we collect on financial management in the government, and figure out how we can improve it and do a better job connecting it, so we can allow agencies to do those things, so that we can take away the things that are boring and rote, and make them more routine by providing better data services to the rest of the government.

What do you think is the most important message about data and analytics in government that you've learned that you would want to share?

Start small, be iterative, be agile, and build as you go. If I step back and I think about all of the data quality issues that face my organization, or if I take a step back and think of all the different ways that I could standardize or data, or align it to different

datasets across the organization, or if I think about how I need to take all of our data systems and immediately bring them together into one location, and make sure they're interoperable, and all the software tools are available – there are just many roads like that are very difficult to go down, because the scope is so huge.

And it's very possible that the project will lose steam before you actually reach the finish line, or worse, that you get to the finish line, and the world has changed under your feet, and the thing that you're delivering is not really what's needed anymore. So I guess my suggestion is always to just do something really small, and get people excited about it and get some wind in your sails, and keep, keep building and building and building

Conclusion & Next Steps

Before agencies dive into the next stages of becoming an intelligent enterprise, they must understand a variety of technologies, practices and approaches to changing the culture that support the way forward.

Today, digitalization and breakthrough technology innovations are offering immense opportunities to deliver better outcomes for government and its citizens. But agencies need to get to work to truly take advantage of this moment and opportunity. Governments must redefine their core competencies, and consequently, rebuild their strategies around those competencies.

Data and digitalization are the foundations for a citizen-focused government. Successfully embracing the opportunities from new technologies and implementing the right initiatives will be key to staying competitive and becoming more efficient and effective in the future.

For those governments embarking on a journey to being intelligent and data-driven, adapt the following best practices:

- Start from user experience and work backward, instead of starting with transforming all data.

- Architect for agility and scalability.

- Build reusable systems and data sources that address multiple use cases.

- Within that architecture, work from one use case "island" to the next, going depth-first, not breadth-first.

- Avoid the time-consuming trap of building the data infrastructure for all potential systems, then the technology for everything, thereby deferring use-case development.

- Carefully analyze end-to-end processes to identify the true root causes of end-user pain points. It is sometimes the process itself.

- Once priorities and pain points are well understood, establish and track metrics based on meeting citizens' needs.

- Design systems to continually track evolving requirements and establish feedback mechanisms that adjust as priorities and requirements change over time.

Thank you to SAP for their support of this valuable resource for public sector professionals.

About GovLoop

GovLoop's mission is to inspire public sector professionals by serving as the knowledge network for government. GovLoop connects more than 300,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to the public sector.

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