Tips For Cultivating a

Data Literate Organization

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Introduction

In many agencies, the vision of data-driven decision-making has hit a snag: Decision-makers, and those who support them, are not all that adept at working with data.

It's understandable. Traditionally, data has been the domain of data scientists, whose deep expertise seems akin to magic — the results are undeniably valuable but their methods are wrapped in mystery.

As agencies look to make greater use of data in decision-making, data scientists' talents will be in greater demand than ever. But data-driven decision-making is not just about processes. It's about data literacy.

The goal is not to create an army of data scientists but to ensure that decision-makers and their staff understand how to use data effectively to answer questions, gain insights and communicate results.

In this report, we explore how agencies are working to increase the data literacy of employees at every level. On these pages, data officials from federal, state and local agencies discuss lessons learned and best practices, as well as the challenges that they've encountered. Topics include:

- **Understanding the basics of data literacy**
- **Getting employees to buy into the value of data skills**
- **Dealing with constraints around budget, staff and other resources**
- **Tapping into the power of automation**

Our experts first shared their insights during a recent GovLoop virtual event, sponsored by Alteryx, which you can watch in full using the link below.

Watch the recorded session

The experts who participated in the virtual event are:

Julia Fischer

Director of Data Services, Maryland Department of Information Technology

Julie Warner

Data Scientist, Office of the Chief Information Officer, Information Technology Service Delivery, Knowledge Management Branch, U.S. Agency for International Development

Stefanie Costa Leabo

Chief Data Officer, city of Boston

Taka Ariga

Chief Data Scientist and Director, Data Innovation Lab, Government Accountability Office

Andy MacIsaac

Solutions Marketing Director, Public Sector, Alteryx

Trending Now: Data Literacy

The buzz around data literacy is growing across the public sector. Here is a look at some of the basic concepts in data literacy and how agencies are applying them.

Data Literacy Defined

NAPA **describes data literacy** and its value to an organization:

"Embracing a common lexicon and fostering 'data literacy' focuses an organization's ability to employ, analyze, and explore data. A common degree of fluency is needed to define effective options, determine proper actions and foster innovation. When there is no shared language, especially in the absence of data literacy, a Tower of Babel scenario emerges with diverging opinions and actions, even when looking at the same data."

Assessing Data Literacy

Gartner recommends using five basic questions to gauge how data literate your organization is:

1. **How many people can interpret straightforward statistical operations such as correlations or judge averages?**
2. **How many managers can construct a business case based on concrete, accurate and relevant numbers?**
3. **How many managers can explain the output of their systems or processes?**
4. **How many data scientists can explain the output of their machine learning (ML) algorithms?**
5. **How many of your customers can truly appreciate and internalize the essence of the data you share with them?**

Grooming Data-Literate Leaders

For those who are not data science natives, training is essential to developing data literacy. With that in mind, the Treasury Executive Institute (TEI), which trains government officials at the Treasury Department and more than 40 other federal agencies, regularly offers data-related courses as part of its curriculum.

For example, in fiscal 2020, TEI ran a **data literacy boot camp** for executives and leaders "who need foundational knowledge and skills to create and lead a data-informed organization." The boot camp included a workshop on data communications, which covered three foundational topics:

- **What data science is and why it's important**
- **Data storytelling, or using data to present and communicate results clearly to stakeholders to encourage change**
- **How to select the appropriate data visualization for a scenario**

Another TEI course focuses specifically on data analytics. The topics include:

- **Understanding advanced data analytics and how to champion analytics in an organization**
- **How to create conditions for success and apply data analytics in new areas at your agency**
- **How to ensure that appropriate data analytics safeguards are implemented for privacy, inaccuracy and bias**

Data Literacy on the Political Agenda

The Biden administration put data literacy on its agenda on Day 1.

As part of an **executive order** (EO) on advancing racial equity and support for underserved communities, the administration created a data working group to ensure that data, not instinct, drives all efforts at addressing equity.

The challenge is that many federal datasets are not broken down by key demographics, according to the EO. "This lack of data has cascading effects and impedes efforts to measure and advance equity," the EO notes.

With that in mind, the working group has two key areas of responsibility:

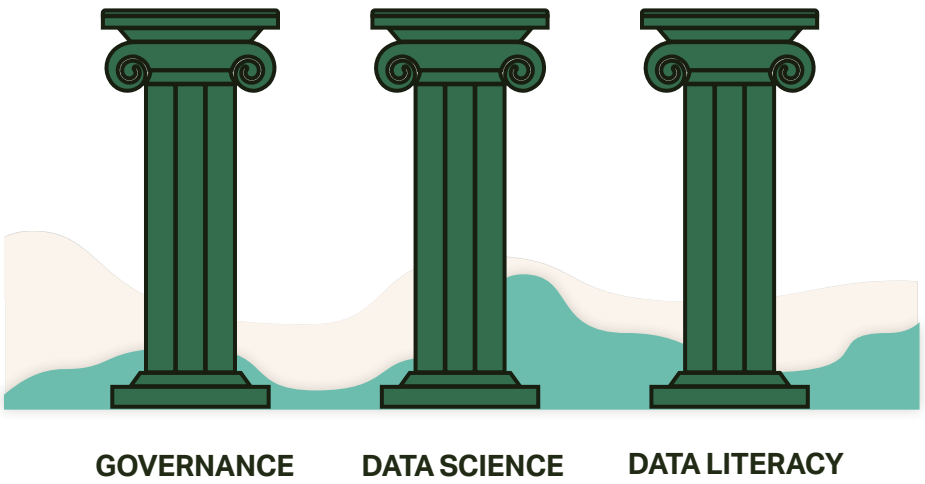
1. **Identifying inadequacies in existing federal data collection programs, policies and infrastructure across agencies, and recommending strategies to address those deficiencies**
2. **Supporting agencies in implementing actions, consistent with applicable law and privacy interests, that expand and refine the data available to the federal government to measure equity and capture the diversity of the American people**

Data Skills as a Career Differentiator

Data skills are in vogue, and the demand for employees who can analyze and communicate data findings will only continue to increase.

This doesn't mean you have to become a data scientist or statistician overnight. In fact, quite the opposite. If you're wondering how you can position yourself and your team to navigate data-centric workplace requirements, the Government Accountability Office (GAO) could be the model you're looking for.

"When we talk about data literacy for an audit organization, we really try to focus on what does it mean to support the kind of professional judgments that auditors need to make," said Taka Ariga, the agency's first Chief Data Scientist.



Ariga shared the three pillars of GAO's data strategy: governance, data science and data literacy. Additionally the agency recently **published its first artificial intelligence (AI) oversight and accountability framework** with the goal of driving conversations around evidence-based verification of AI systems.

"As federal programs increasingly integrate algorithmic capabilities, data literacy becomes even more important when AI systems are often opaque," Ariga noted. "Making sure that humans [are] capable of [remaining] in the proverbial driver's seat is actually a key to successful implementation of AI solutions."

That's why proper training for government employees, particularly auditors providing oversight, is essential. Ariga emphasized the strategic approach to gain support from not only senior leaders and middle managers, but also analysts, who are the intended audience for the data literacy training.

"There is an opportunity for them to strengthen their tradecraft," he said. "It helps them to sort of navigate a crowded career market."

In the private sector, for example, there is an expectation for professionals in this space to marry the audit and data analysis tradecrafts in ways that can be tested and verified. At GAO, employees recognize the traditional way is no longer sufficient in a world dominated by cloud services and AI, Ariga said.

Filling Training Gaps, Gaining Employee Buy-In

Gaining support is not about being punitive. There's no messaging that says, "If employees don't augment their current skills with data literacy, they'll be irrelevant." Upskilling doesn't involve shoving PowerPoint slides and endless hours of training materials onto employees either. Instead, there is a clear focus on the "why" of training and "how" it will benefit agency outcomes.

"We really try to incentivize them as, 'Here is an opportunity for you to grow your career,'" Ariga said. Bolstering data literacy puts GAO employees in a position to make informed recommendations, facilitate solutions, impact policy suggestions and drive accountability across federal programs.

Ariga wants to know how GAO impacts the audits of tomorrow.

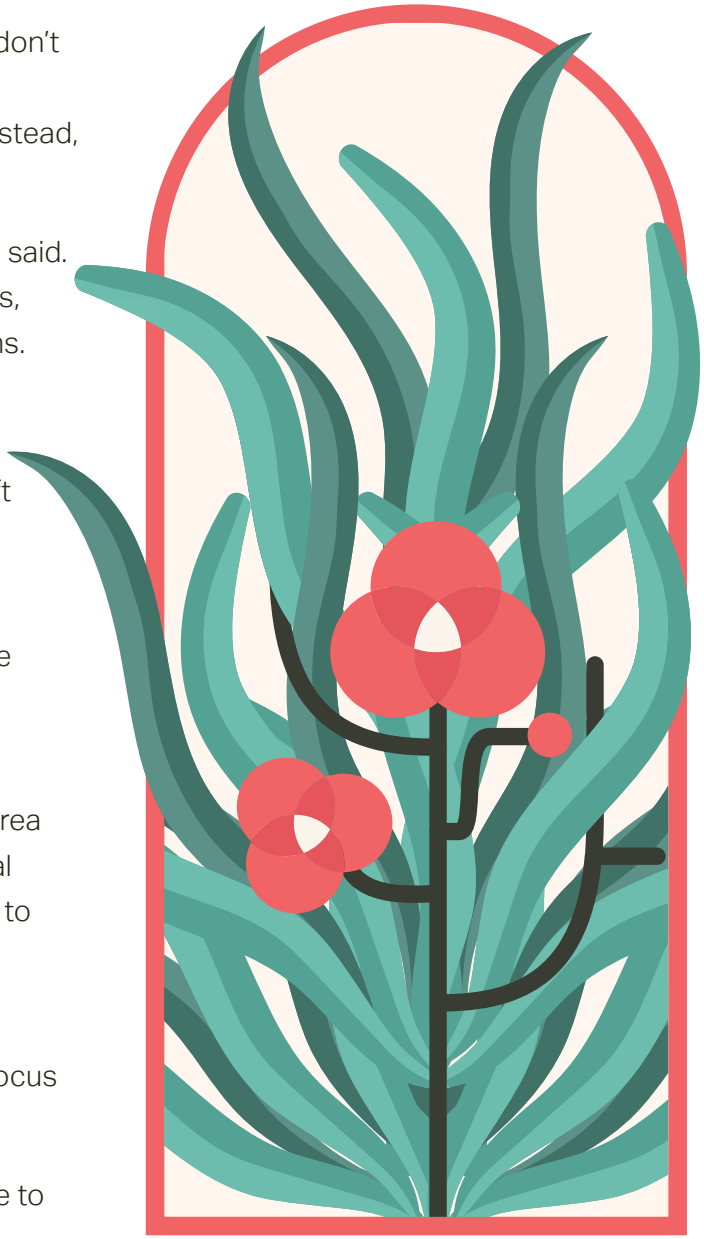
"We want to make sure that our upskilling process is specifically relevant to the audit tradecraft in terms of how we answer a researchable question," Ariga said.

This is about incorporating aspects of data science into analysts' daily engagements so that they know how to audit AI algorithms, blockchain or other digital information systems when the need arises.

Increasing GAO's data literacy efforts involves creating a curated curriculum with different learning paths to ensure that techniques or capabilities are relevant to analysts' domain or area of expertise. In other words, analysts focused on physical infrastructure or energy or national defense have different considerations relevant to the analytical techniques that might apply to those domains.

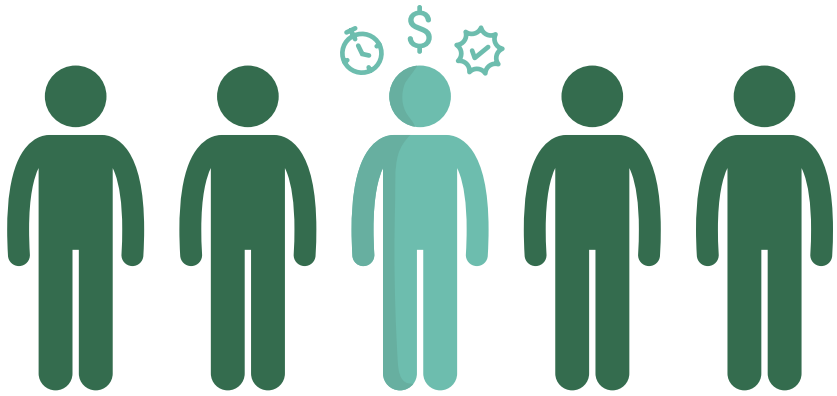
On-demand reinforcement, coupled with a sandbox environment for hands-on learning and content curation are foundational for developing the data literacy program, Ariga said. The focus is applying data to the audit tradecraft in a way that is transparent, explainable and linear.

Think of it this way: If the government accuses someone of committing fraud, it must be able to explain why.



"What we are trying to impact here is the middle management layer," Ariga said. "These are the cohort that not only have the responsibility of knowing why we do things but also have to know how we do things."

Getting Middle Managers On Board



Digital natives are joining GAO's workforce. They can do many data-centric jobs, and they're comfortable with open source tools, AI and ML, and data-driven, evidence-based policy-making processes.

But they might not always understand the "why" that's driving the work because they are newer in their career path.

Unlike rank-and-file employees and senior leaders, middle managers typically have different levers that influence their outlook and decision-making. "They are incentivized by meeting budget, meeting quality and meeting time," Ariga said.

He's exploring how the agency can enable middle managers to develop the type of data literacy that will augment quality and possibly reduce time and ultimately budget. This is about providing a data-paved path for meeting GAO's mission and objectives more efficiently, economically and equitably.

Data Pain Points: Time, Staff and Skills

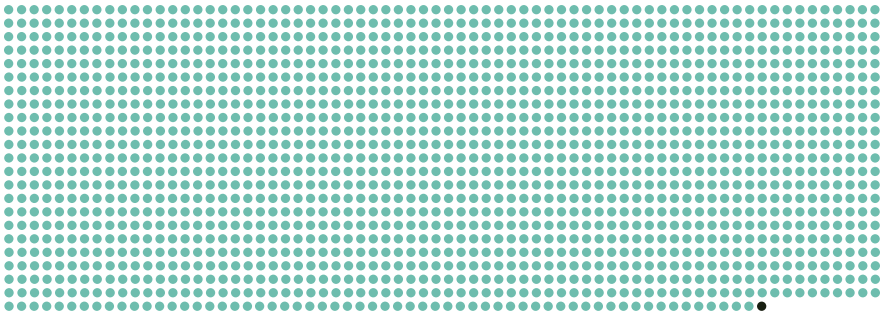
Increasingly, agencies are creating central teams to drive data initiatives and promote data literacy. The goal for these offices is to coordinate incisive, cross-cutting analytical and data-based projects, improve data maturity, and expand data services. The reality is more foundational: problem-solving and troubleshooting backlogs of requests, while building basic data literacy and standardization.

Here are some case studies in how these offices are dealing with their pain points.

A Need for Fundamental Conversations

As Director of Data Services at the Maryland Information Technology Department, Julia Fischer leads a team of eight people.

The office's role is to direct strategic enterprise data efforts. Its customers are other state departments and employees, a force of greater than 15,000 people.



In Maryland, there are almost 2,000 government employees for every member of the statewide data services team

government employees statewide data services team member

Some basic arithmetic finds that there are almost 2,000 state employees for every member of Fischer's statewide data services team – an unflattering ratio representative of the uphill challenges that confront government data and analytics teams.

This situation is not unusual. Central data offices across government are outnumbered in staff, time and budget. Something's got to give.

"I believe that those fundamental conversations are even more important than those conversations on how to analyze data," Fischer said.

Looking for Force-Multipliers

Stefanie Costa Leabo, Boston's Chief Data Officer, counts herself as fortunate. She has a staff of 20, one of the more impressive tallies for local government data departments. But she too has found that it's helpful to take a step back before launching into aspirational analytic projects.

Her goal is to foster data literacy across departments in hopes of stoking internal investment so that one 20-person department isn't responsible for a whole city's worth of analytics. Those efforts, which include one-on-one training and templates for how to design surveys, have had success.

For example, the Boston Fire Department has taken her up on her offer. After collaborating closely on several projects, it hired its own data point person and is now a self-sufficient, standalone analytics operation.

Reskilling, Upskilling

Elsewhere, central data departments have crafted campaigns to improve data literacy and recruit data practitioners. Outsourcing analytics projects is often accomplished through reskilling and upskilling, whereby people without data science degrees train to become functional data owners in their enterprise.

Such training is important because it educates people on cyber-security, data fidelity and analytics. These elements must kick in before moving to data visualization and analysis technology, experts agreed.

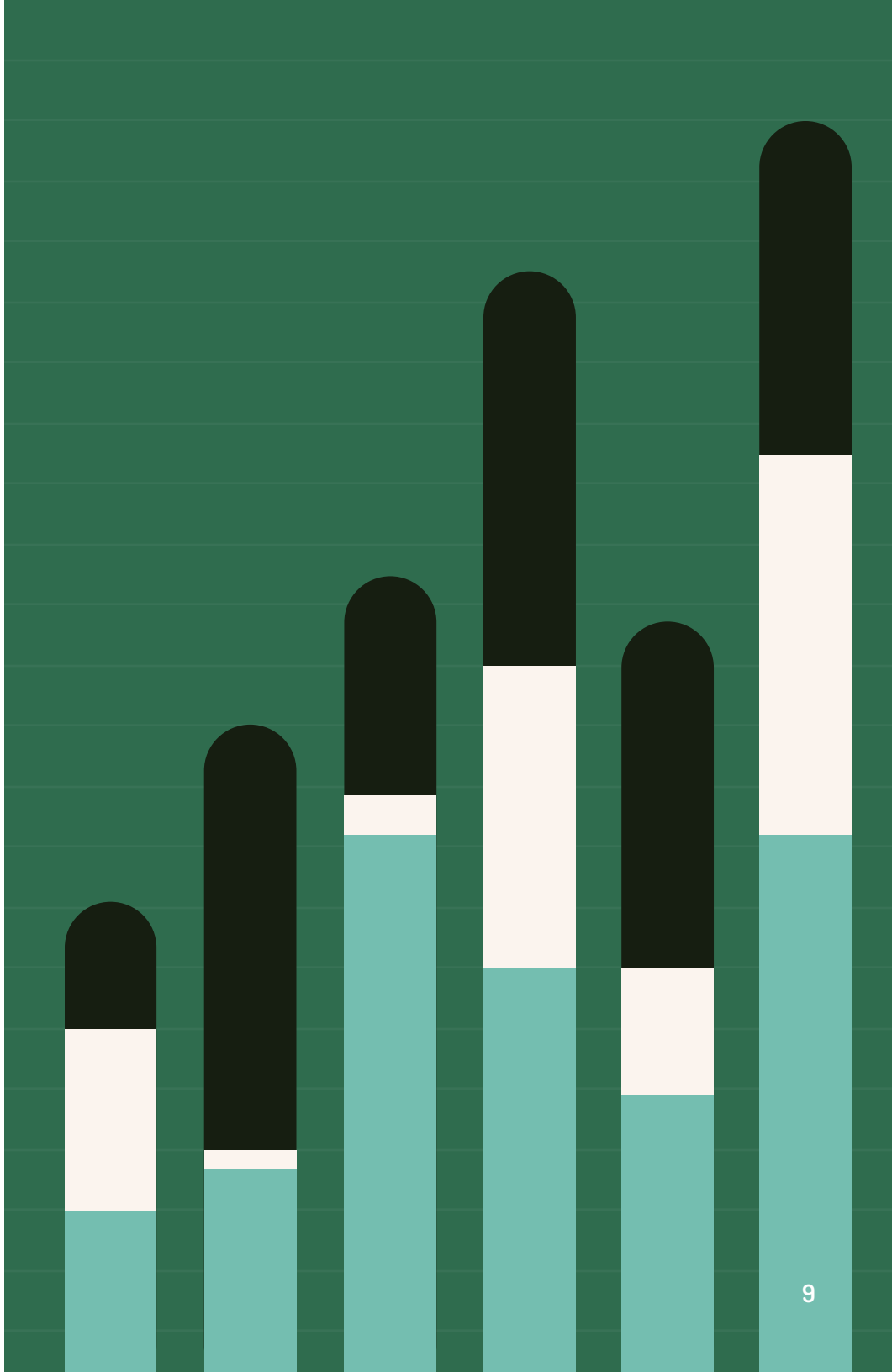
The U.S. Agency for International Development (USAID) is reskilling and upskilling its employees on data by setting up an informal learning group for Tableau, a popular data visualization tool. The agency is also part of a cross-agency pilot to hire data scientists with a standardized set of certifications.

"There's just so much that goes into being able to use the analytical and visualization software that goes beyond just nuts and bolts," said Julie Warner, Data Scientist at USAID.

As data departments try to expand their influence and prove their work, time is of the essence.

Many government data scientists familiar with existing systems and structures are retiring or will be soon, leaving knowledge gaps and vital positions to fill. Though it can be tough to fit it into an already packed 9-to-5, training needs to happen now, Maryland's Fischer said.

"You just have to force [the issue] at some point," she said.



Tech Focus: Data Process Automation

In today's world, data issues are work issues. When there are problems with the processes for gathering and analyzing data, they become problems for everyday workflows.

Take this team of business auditors at a state government, for example. Working with this team, Alteryx, an analytics platform provider, discovered that the auditors were identifying businesses to assess based on what they read in local papers. As one might deduce, their method of data collection was meager and inefficient, found in the pages of information meant for the general public and not for a skilled cohort of business auditors. They needed to upgrade their data pool without wasting time manually ingesting large quantities of data.

Inefficient manual processes, data complexity and a lack of talent were all barriers to efficient audit analyses. Automation helped.

Analytic process automation (APA) unifies and automates the process of transforming data into insights. With APA, the team automated the processes of preparing data for analysis – gathering, cleaning, ingesting, etc. – so that they could draw auditing insights and conduct timely, valuable investigations. With automation, they didn't need to be data scientists but instead could focus on what they were skilled at: business auditing.

"It's about being able to leverage greater sources of data and automate that process of incorporating data into the analysis to find the connections and the anomalies," said Andy MacIsaac, Alteryx's Solutions Marketing Director for Public Sector.

Fortunately, APA can be used for various use cases, from finance and human services to geospatial analysis. According to IDC, 44% of data workers' time is wasted on searching and preparing data. By automating these processes, employees can focus on more valuable work across the board and agencies can achieve more impactful results.

"We're augmenting the capability to do higher-level work," MacIsaac said.

Here are other examples of what agencies have been able to achieve with APA:

- **A Florida city shortened the time it took to identify abnormal water usage from 55 days to two. This helped conserve water resources and notified consumers of leaks or related issues in a timely manner.**
- **A state government saved more than $1 million in duplicate payments. It targeted the funds to priority issues and reduced organizational silos across departments.**
- **After a hurricane in Puerto Rico, an agency identified and deployed resources to areas with the greatest damage, affording a faster road to recovery.**

"Once you're able to focus on analytics, data science, automating processes and upskilling data literacy, that's where organizations are going to realize breakthroughs," MacIsaac said.

How Alteryx Can Help

Alteryx provides automated analytics and data science capabilities designed to make advanced analytics accessible to any data worker. Automation accelerates the process for gathering, preparing and analyzing data, enabling people to deliver faster, better outcomes.

Such automation is one of the pillars of a data initiative, MacIsaac said.

"You've got to look at the technology, the data and the people all together," he said. "You can build a lot more capability into your organization if you have the right technology platform combined with the right data literacy program and the people who want to build their skills. You can build that increased capability through analytic automation.

Takeaways | 10 Tips for Cultivating a Data Literate Organization

1. **Focus on storytelling.** Throw a bunch of numbers at someone and their eyes will glaze over. But use those numbers to tell a story (e.g., what happened, why it matters, what might happen next), and you just might win them over.

2. **Identify data gaps.** Before launching an initiative to support evidence-based decision-making, make sure you have the evidence that decision-makers actually need.

3. **Stoke internal investment.** One team of data experts can do only so much. But if they get other teams to make their own investments in data tools and expertise, good things can happen.

4. **Automate, then automate some more.** Processes for searching and prepping data can be laborious. By automating them, agencies can free employees to focus on higher-level, more interesting work.

5. **Do the math.** Do data offices have the resources (staff, time, budget) to do the work being asked of them? If not, make the case for addressing those deficiencies.

6. **Keep it positive.** It might be tempting to tell employees that they risk becoming irrelevant if they're not data-savvy, but don't go there. Focus on the benefits, both to the employees and their organizations.

7. **Talk about tradecraft.** One of the best ways to get rank-and-file employees interested in developing their data skills is to highlight how it can become a resume differentiator.

8. **Force the issue.** Many current data scientists are expected to make an exodus in the coming years. Start training a new cohort of data enthusiasts now.

9. **Get middle managers on board.** As one expert pointed out, concerns around project budgets, quality and schedule motivate middle managers. Show them how data speaks to those concerns.

10. **Make it relevant.** As much as possible, align data training to the agency's mission and essential areas of expertise.

About Alteryx

Alteryx, the Analytics Automation company, is focused on enabling every person to transform data into a breakthrough. Alteryx unifies analytics, data science and business process automation in one, end-to-end platform to accelerate digital transformation and shape the future of analytic process automation (APA™). Organizations of all sizes, all over the world, rely on Alteryx to deliver high-impact business outcomes and the rapid upskilling of their modern workforce. For more information visit http://www.alteryx.com.

About GovLoop

GovLoop's mission is to "connect government to improve government." We aim to inspire public-sector professionals by serving as the knowledge network for government. GovLoop connects more than 300,000 members, fostering crossgovernment 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 connect and improve government.

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