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Is Data Fabric an Option for Government?

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Is Data Fabric an Option for Government?

As agencies work to comply with data management laws, cybersecurity initiatives, AND improve mission outcomes, a comprehensive data strategy combined with a data fabric will put your agency's data on the road to mission success.

The federal government has codified agency data management via H.R. 4174, the Foundations for Evidence-Based Policymaking Act of 2018 (signed into law in 2019). The law requires, among other things, that agencies develop and maintain a comprehensive data inventory that accounts for all data assets an agency creates, collects, controls, directs or maintains, to the maximum extent practicable. The bill also requires federal agencies to develop evidence-based policy and evaluation plans.

In practice, that means agencies must be able to use the data to support mission objectives.

However, the requirements of the law alone will not truly unleash the power of agency data to serve mission outcomes. That requires advanced analytics.

To learn where agencies are on the road to mission-focused data management, IBM partnered with Market Connections to assess the state of data management—particularly the use of data fabric—in the federal government. The following report outlines the study findings and discusses how the government can effectively use data to support mission objectives and create evidence-based policy.

THE NEED FOR A ROADMAP

While H.R. 4174 defines what data agencies need to manage, the Federal Data Strategy (FDS) provides a 10-year vision for how the Federal Government can accelerate the use of data to deliver on mission, serve the public, and steward resources while protecting security, privacy, and confidentiality. The Department of Defense Data Strategy (DDS) has a similar mission.

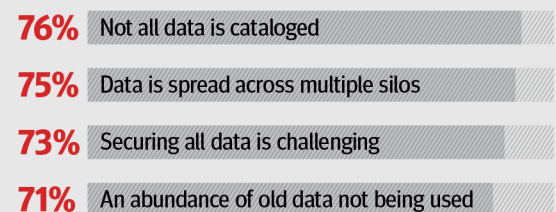
The FDS and DDS offer roadmaps to creating the mission-focused data strategies that H.R. 4174 codifies. Yet half of respondents are only somewhat familiar with these strategies: 51% of Federal Civilian respondents know about the FDS and 47% of Defense respondents know about the DDS. Another third has heard of these strategies but aren't sure what they are (and therefore how they can help).

Only 32% of agencies are very confident in their data management

6 out of 10 are only **somewhat confident** in their organization's ability to govern, manage, and protect its data.



TOP CHALLENGES ARE:



Lack of confidence may be related to lack of implementation plans

2 in 10 have a fully implemented data strategy



51% have a partially implemented plan

14% have a strategy on the near-term roadmap, but have not started implementation

Only two respondents in ten say their agency has fully implemented a data strategy. Half have a partial strategy in place or are just starting implementation, and 14% say it's on the near-term roadmap.

This lack of implementation may explain why two-thirds of respondents are only somewhat confident in their organization's ability to govern, manage, and protect its data.

Respondents face a host of barriers to implementing a data strategy as well. With attention focused on Zero Trust and cybersecurity guidance and mandates, it is not surprising that three-quarters found modernizing security architectures the top barrier to implementation. That said, all the barriers are challenging. Two thirds say lack of internal resources to manage, breaking down data silos, and lack of IT staff expertise are barriers. These barriers, too, impact confidence levels.

In addition to the barriers to adoption, there are also challenges with access to data and data management. Securing all data is an overarching challenge, with 73% citing it—almost the same number as those that found security a barrier.

The top challenges with both access to data and managing it is that data is spread across multiple silos (75%).

Access challenges include:

- 68%: Going through others to get data access
- 68%: Having appropriate data permissions set
- 65%: Tracking who has accessed the data
- 62%: Accessing needed data in a timely manner
- 57%: Understanding data codes/data lifecycle is.

While data management challenges include:

- 71%: Abundance of old data that isn't being used
- 67%: Abundance of duplicative data
- 65%: Tracking who has accessed the data
- 59%: Tracing back data to where it came from
- 53%: Unsure of data quality

With the lowest percentage being 53%, it is clear everything is a challenge when accessing and managing data. Additionally, agencies have questions about when and if it's possible to retire old data to less expensive storage and what the data lifecycle is.

2/3 Say Processes and Standards are Key for Data Strategy Success

Among respondents with a fully implemented data strategy in their organization:

Establishing processes and standards is mentioned more than twice as often as a **key factor that led to their successful implementation**



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HOW CAN AGENCIES CREATE AN ACTIONABLE DATA STRATEGY?

Because H.R. 4174 requires it, most agencies have created a Chief Data Officer's (CDO's) office. However, whomever is producing the data needs to talk to the people who use the data every day to tie data to the mission. That requires a Chief Data and Analytics Officer (CDAO): a person who can merge the data management, data cataloging, and analytics with the mission outcome.

Under the CDAO's guidance, the following six-step process can help create a data strategy that works today and into the future¹:

¹ - Adapted from IBM's Data Strategy Framework, accessible at <https://www.ibm.com/resources/the-data-differentiator/data-strategy>



Step 1. Understand your agency's business & mission objectives

To align business and data priorities, you need a clear understanding of your agency's leadership vision. To help leadership see the strategic merits of data—not only the regulatory requirements—create clear priorities based on the vision so they can see what they need to do with their data that they can't do today. To do this:

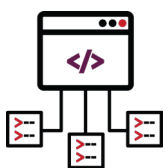
- Determine your tactical needs around data—what data will help you accomplish mission and business outcomes?
- Identify the most compelling use cases.
- Know the tools in your toolkit. Ask what is holding you back (data access, data security, data lineage/provenance, data trustworthiness, and so on).
- Familiarize yourself with your organization's digital transformation strategy.



Step 2. Assess your current state

Looking across your ecosystem, assess what is working and what's not. What are the barriers to building a true data-first experience? Organizational silos often underlie challenges with data integration, data management, and workflows. To work efficiently, staff need data access with the right controls in place—whether through a self-service function or managed service function (where a specific data engineering team could be creating data pipelines and products in support of a domain of a data mesh or an overall data fabric). Access should never be a barrier.

- Examine data to uncover what you have and what you need.
- Take inventory to know who's on board and what they bring to the table.
- Prioritize critical data elements for governance.



Step 3. Map out your data strategy framework

Both the FDS and DDS can help you determine your target state, operating model, and implementation blueprint—which will help you brainstorm, improve, and evolve your data strategy. This will empower your teams to navigate challenges using a clear data management approach. Outline your comprehensive vision so that data strategy conversations, and the resulting business process changes, are as meaningful to application engineers as mission managers.

- Determine what data you have, where it is, who owns it, and how it can be leveraged. Data cataloging is an important first step to data product creation (data mesh), data pipelines, or virtualization of data.
- Be specific about where application modernization, automation, and AI can take your strategy to the next level.
- Measure progress toward your goals.
- Capture your data strategy highlights—and share them. Include in your data strategy overview:
 - Observations, challenges, and recommendations.
 - Objectives, outcomes, and measures.
 - Cross-functional data needs to support multiple use cases.
 - Data privacy and security needs.
 - Data topology, data organizations and pipelines.
 - Reference architecture and supporting technology.



Step 4. Establish controls

Whether it means innovating legacy systems, jettisoning old products, delegating to data-savvy partners, or applying AI across the agency, your task is to focus on your data objectives with as little sidetracking as possible. Consider the best ways to put insights from data users to work, which may include leveraging pieces of a data fabric you already have. Implementing the data topology you created in the strategy phase sets your information in motion across multiple lines of business, helping you keep tabs on use cases and monitor various controls for each.

- Outline a data governance policy based on quality, privacy, and security.
- Identify your data advocates.
- Standardize your nomenclature.



Step 5. Create integrated solutions

For a data strategy to take hold, agencies often need to re-engineer the culture around new concepts such as hybrid multi-cloud environments and end-to-end data-management capabilities. That sounds daunting, but it is possible. Start by thinking about short-term valuable and viable wins. Assemble your cross-functional team against clear objectives. Then, set short sprint cycles with actionable milestones that will help prove results. Also think about an overall managed services-based solution as a mechanism for bringing in capability based the cloud environment you are in and the cloud and data security, privacy, and other requirements you already have.

- Create a central catalog to find—and share—insights.
- Encourage adoption from all directions by empowering data consumers.



Step 6. Scale your team and processes

Consider a managed service approach, which will allow you to scale more quickly. And let people across the enterprise know how much you are achieving with quick updates and regular reports. Don't be shy about sharing performance metrics on how your initiatives and outcomes are making good on early discussions with senior stakeholders. Measurable results will reinforce your unique value and support your continued campaign to lead the way with effective data storytelling.

- Hire (and reskill) talent to stay agile.
- Foster data literacy—all the time.
- Build strong partnerships across the organization.

WHAT CAN AGENCIES DO TO SUPERCHARGE THE STRATEGY?

“Data fabrics reduce the complexity in movement, transformation, and integration of agency information. It’s about making the data available across the enterprise where you need it to make better decisions. That is how to comply with H.R. 4174 AND improve mission outcomes.”

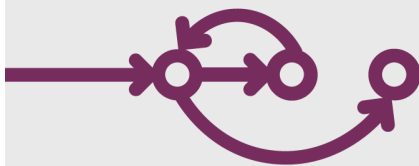
—Jonathan Entwistle, Expert Labs Market Leader and Industry CTO - US Federal, IBM

No matter how well crafted, a data strategy alone will not help the CDAO extract insights from the data. But implementing a data fabric can. Automation leads to ease, and in the case of data management, the ability to serve more constituents without adding to the workload of program staff.

Imagine that mission delivery teams could use the data you are already collecting to identify interesting trends in their programs. Imagine if everyone who needs to access the data has it, ensuring nothing your agency collects goes to waste. It’s a win for everyone.

Data fabric helps make this scenario possible. According to Gartner², data fabric can “free staff to provide more benefits from more data.” Traditional practices require significant human effort before the data can be analyzed, meaning analysts spend more time collecting and organizing the data than analyzing what it means for the mission. Data fabric automates and accelerates the introduction and exploitation of second- and third-party data. This, in turn, helps you assess and prioritize what data you put into your data warehouse.

Data fabric simplifies data strategy implementation challenges...



...by facilitating the end-to-end integration of various data pipelines and cloud environments through use of intelligent and automated systems.

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Modernizing security architectures	76%
Lack of internal resources to manage	66%
Breaking down data silos	65%
Lack of IT staff expertise	64%
Determining which vendor(s) to use	60%
Determining what set of technologies needed	59%
Lack of a roadmap/plan to implementing a strategy	57%
Unsure which strategy to follow	53%

2 - Gartner. “Top Strategic Technology Trends for 2022: Data Fabric.” Published 18 October 2021 - ID G00749680

Gartner says data fabric offers the potential to recover up to 70% of data discovery, analysis, and implementation tasks from a targeted delivery team. It can do so at the same time as modeling for, then adding, augmented data management solutions in a prioritized, evolutionary model that avoids “rip and replace” activity. “A data fabric uses continuous analytics over a combination of existing, discoverable and inferred metadata assets to inform smarter and more effective support of data management tasks, regardless of deployment platform and architectural approach.”

This is important because governance and catalogs for the sake of governance and catalogs will not support evidence-based policy decisions or facilitate mission objectives.

Cataloging data is the first step. Data fabric is what links the analyst to the data in the catalog. Only then can you go do interesting work as a mission analyst because now you’ve got access to data, you can understand and trust it, and you can monitor it in the organization.

IS DATA FABRIC AN OPTION FOR GOVERNMENT?

Government agencies are being asked to extract actionable analytics from their data via requirements such as evidence-based policy. To do this, they need the to build the right tool for the right job. Data fabric is one option.

While two thirds of respondents are are familiar with the term data fabric, respondents do not appear to fully understand the benefits of it. While four in ten say it augments data integration, only one-third understand that it means the right data is available at the right time to the right application. Only three in ten say a benefit is automating governance, data protection and security and helping identify and connect data to discover unique relationships between data points.

Data fabric helps connect agency data to mission outcomes

Data fabric provides a host of benefits, but respondents do not see the connection

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WHAT IS DATA FABRIC?

Data fabric is one of those terms that has a variety of definitions. To ensure all respondents were thinking about it the same way, they answered questions based on this definition:

Data fabric is a design concept that serves as an integrated layer (fabric) of data and connecting processes. A data fabric utilizes continuous analytics over existing, discoverable and inferred metadata assets to support the design, deployment and utilization of integrated and reusable data across all environments, including hybrid and multi-cloud platforms.

Top Benefits of Implementing Data Fabric

Augments data integration	43%
The right data is available at the right time to the right application	34%
Automates governance, data protection and security	29%
Helps identify and connect data to discover unique relationships between data points	28%
Cost savings	27%
Time savings	21%
Enables self-service data consumption and collaboration	21%
Aids in progressing organization's data strategy	16%
Translation of data for easy understanding	16%
Automates data engineering tasks freeing up resources	16%
Do not currently see any benefits of implementing data fabric in organization	3%

How Agencies Perceive the Benefits

Other top benefits of data fabric include supporting the data strategy, freeing resources, enabling self-service data consumption, and time savings. Yet well under one-quarter of respondents noted any of these as benefits.

Cost tops the list (66%) of implementation barriers. Almost half are concerned with security. And nearly four in ten don't understand how data fabric would work in their organization. Data fabric implementation addresses these barriers by reducing cost and improving security³. In fact, data fabric is an important part of a zero-trust strategy because effectively, it enhances visibility into how people are using data, auditing the data in real time, and provides greater visibility—all of which enables better adherence to zero trust principles.

CONCLUSION

They say the road to nowhere is paved with good intentions. That is because good intentions themselves do not lead anywhere. To get to your destination, you need a plan and a road map—and the tools to interpret the landscape.

H.R. 4174 provides a strong foundation upon which to build a data strategy. But adhering to the letter of the law is a good intention, not a plan to unleash the power of your agency data. Fortunately, both the FDS and DDS provide actionable visions.

Every study provides at least one surprising finding. Given the requirements of H.R. 4174, we expected the majority of agencies to have fully implemented a data strategy. Instead, we found only about 20% have done so. While half have a partial strategy in place or are just starting implementation, that is not enough to fully utilize data for mission outcomes. We believe this lack of implementation explains why two-thirds of respondents are only somewhat confident in their organization's ability to govern, manage, and protect its data.

Two results we did expect were data management challenges related to data being spread across silos (75%) and securing data (73%). These are common themes across recent research from a variety of sources.

Research from industry experts such as Gartner point to data fabric as a way to address those challenges. In fact, when in place, the data fabric:

- Enables AI—it helps agencies understand and access the data.
- Provides trusted data—It tracks the lineage of every piece of data: where data is in the government enterprise, where it came from, and who has changed or touched it.
- Provides data access—It shortens the time it takes to access data taking the process down to minutes, in a more secure workflow.
- Enables zero trust security—Data fabric enables audit capabilities, creates user access logs, and limits the blast radius of a cyber breach.

Building a data fabric is easier than you may think. Today's technology automates much of the previously manual work of creating a fast and secure data fabric. A modern data fabric automatically understands the metadata of its source systems, integrated with a data catalog, and provides a secure workflow for data access. With data fabrics, agencies and their data stewards can create a holistic view of their agency data. The payoff is improved mission outcomes, including the ability to serve more constituents. At the end of the day, that is what matters most.

3 - Think Insights (November 21, 2022) Data Fabric. Retrieved from <https://thinkinsights.net/data-literacy/data-fabric/>.

ABOUT THE STUDY

The blind online survey fielded from August to September 2022 with the objective to assess the state of data management in federal government. It included 300 federal respondents who are influential in the IT decision-making process in their agency—60% Civilian and 40% Defense. Their decision-making involvement is: Develop contract requirements, 49%; Evaluate firms and/or bids, 47%; Manage or implement solutions, 42%; Recommend firms and/or bids, 39%; On a team that makes decisions, 38%; Make the final decision or approval, 8%.

ABOUT IBM

IBM defines data fabric as an architectural approach to simplify data access in an organization to facilitate self-service data consumption. This architecture is agnostic to data environments, processes, utility, and geography, all while integrating end-to-end data-management capabilities. A data fabric automates data discovery, governance, and consumption, enabling enterprises to use data to maximize their value chain. With a data fabric, enterprises elevate the value of their data by providing the right data, at the right time, regardless of where it resides.

IBM's Consulting Service offers a full suite of data offerings that includes advisory, design, build, and managed services designed to meet agency missions by addressing the needs and data challenges of Federal Government CDOs and Program Leads. The IBM team provides end-to-end program integration support focused on the client data strategy, understanding the current state of data and analytics maturity, and helping clients discover their unique data point of view.

IBM's Technology Products include IBM Cloud Pak® for Data, allowing organizations to experience the benefits of data fabric in a platform solution that makes all data available for AI and analytics. This is why IBM was named a leader in the 2022 Gartner® Magic Quadrant™ for Data Quality Solutions.

For more information visit: <https://www.ibm.com/us>

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