



Big Data: Accelerating Time to Mission-Critical Insights

MARKET TRENDS REPORT



Introduction

Information becomes valuable when it turns into knowledge. Government agencies have access to vast volumes of data, but because it is spread across different sources, systems and sites, they have a tough time getting the evidence-based insights they need to rapidly advance mission objectives and improve public services.

Big data comes with the promise to help agencies find the proverbial needle in the haystack — the patterns, outliers, relationships, metrics and anomalies that can form the basis of deeper insights about government initiatives. In practice, however, it takes more than data availability. It is difficult for humans to make sense of billions or trillions of data points within a multitude of ever-growing datasets without the assistance of analytical technology.

Teasing out insights from big data can seem like a daunting task, but it doesn't have to be. A big data analytical framework puts data in service of public servants. A framework connects multiple datasets and supports robust analysis capabilities with minimal delay and maximum clarity.

When data analysis is accessible, government employees can focus on finding relevant insights in a timely way. When data analysis is simplified, more people can learn from data and use it to make decisions. And when big data technology meets current industry and regulatory compliance requirements, and is also adaptable as needs change, agencies become future-ready.

To learn more about how agencies can effectively tap into the power of big data, GovLoop partnered with AlphaSix on this report. AlphaSix provides government agencies with a broad range of IT solutions and services that focus on the convergence of big data and cybersecurity. In this report, we share the challenges that agencies must overcome to leverage available data, the steps to make big data purposeful and best practices for harnessing big data to deliver mission-critical insights.

By the Numbers

87%

of states cited “business intelligence and data analytics” as their biggest workforce need.

Source: [Center for Digital Government's 2018 Digital States Survey](#)

“Improving data and analytics capabilities is consistently ranked as a top priority for government organizations, yet few manage data as a critical enterprise asset.”

Source: [Gartner](#)

125 zettabytes

The amount of global data is expected to grow from 33 zettabytes in 2018 to 175 zettabytes by 2025. (A zettabyte is equal to 1 trillion gigabytes.)

Source: [Seagate & IDC's Data Age 2025](#)

“Government data’s value is latent and requires innovative analysis to unleash. But despite their special position in capturing information, governments have often been ineffective at using it.”

Source: [Viktor Mayer-Schönberger and Kenneth Cukier, “Big Data: A Revolution That Will Transform How We Live, Work, and Think”](#)

60–73%

Between 60% and 73% of enterprise data goes unused for analytics

Source: [Forrester](#)

49%

In 2025, an estimated 49% of the world’s stored data will reside in public cloud environments.

Source: [Seagate & IDC's Data Age 2025](#)

THE CHALLENGE

Extracting Knowledge From Big Data

Big data is a key strategic asset for government agencies. Solving the kinds of complex problems that government deals with requires deep analysis across multiple large-scale datasets, often collected over long periods.

But these valuable datasets and the systems that store them are often decentralized and disconnected. Analyzed on its own, one dataset may not reveal the entire story or lead to flawed conclusions. As long as data is kept apart in silos, it is difficult to look across datasets for changes, patterns, anomalies and trends. As a result, useful data goes unused and problems go unsolved.

With so much data to deal with, it can be challenging for agencies to keep up. Government employees spend much of their time gathering, structuring and cleaning up data, leaving little capacity for analysis and decision-making

Stephen Moore, Chief Technology Officer at AlphaSix, likens this to the Pareto principle, or the 80/20 rule. “Imagine an

agency that spends 80% of its time preparing data and just 20% using that data to find insights,” Moore said. “That’s not the balance you want. By automating the bulk of the data preparation, we can flip the 80/20 and spend more time prioritizing analytics.”

How agencies manage their data adds to the challenge. It’s not unheard of for separate teams to collect, maintain and secure data, while data scientists — scattered agencywide — perform independent analyses with multiple tools for different purposes. Technology can forge connections between these capabilities to make big data accessible and analyzable, but deployment comes with complexity.

“There isn’t a big data silver bullet,” Moore said. “There isn’t one tool. You have to tie together the infrastructure, systems and security with a flexible analytical framework — creating a ‘data fabric.’ But even more important is for agencies to see the big picture of what big data can do.”

THE SOLUTION

An Adaptable Framework for Data Insights

To approach big data in a way that leads to more insight, Moore said agencies first need to commit to a data fabric concept. It’s a commitment that must come from the highest leaders — people who can shift culture and change mindsets to embrace big data capabilities agencywide. It’s a vision that supports investment in big data analysis as an effective means for propelling an agency’s mission forward.

“The key is for agencies to work out their use cases for big data,” Moore said. “A use case is the problem you’re trying to solve, the question you’re trying to answer, the need you’re trying to meet and what people want to do with the data. Then you’re ready to establish an architecture for how big

data analysis can reveal relevant information about those specific use cases.”

An adaptable underlying analytic framework is the starting point for extracting more value from big data today and preparing for a data-driven future.

“You don’t have to lock data into black box systems or rebuild how you collect, process and store data for every new visualization tool you want to use,” Moore said. Agencies can break out of the cycle of redoing and upgrading their big data systems every few years. Data will change over time, but the analytical framework you use can evolve and grow as needed.

BEST PRACTICES

How to Go From Information to Insight With an Analytical Framework



1. Design for purposeful big data

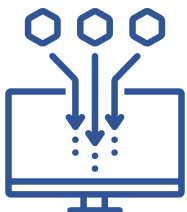
Data needs a purpose. It's crucial to put upfront effort into understanding the way your agency will use a big data-centered environment. To ensure the implementation of an analytical framework that supports your agency's current use cases and stays flexible enough to meet future needs, work collaboratively with your vendor from the beginning. Asking the right questions early on makes it easier to get started and results in a manageable implementation process. This will allow you to position your big data project clearly within the larger context of your agency's mission success.



2. Collect data adaptably

Data is created in many places. These data collection points exist inside and outside your agency, and they will yield a mix of structured, semi-structured and unstructured data. You need a flexible, scalable way of ingesting and storing the sheer volume and variety of data to integrate it into your data framework system. This means working with the different teams and groups that generate the data.

Data collection is not a one-time event: As your agency's needs change over time, you will need to bring new data in new formats into the system.



3. Load different data sources into a unified system

Raw data must be processed into an analyzable format and loaded into an accessible, centralized framework. But the larger and more complex the volume of data is, the more challenging it is to process. By decoupling analysis from raw data's format, you can optimize your agency's ability to extract useful information and turn it into real-time, actionable insights.



4. Resolve analytics into insights

Once the relevant data is collected, loaded and prepared, analysis can begin. You can then write machine learning algorithms against the data, plug a visualization tool into the framework, or apply filters and perform queries as needed. These analytic approaches can reveal patterns in massive amounts of big data, pinpoint telling anomalous behaviors and allow you to discover areas of concern so your agency can act quickly and decisively.

This process of going from big data design to insights is cyclical. As you learn from data and apply it to your use case, you will want to continue to expand the data you collect and refine your analytical architecture.

"There isn't a big data silver bullet. There isn't one tool. You have to tie together the infrastructure, systems and security with a flexible analytical framework — creating a 'data fabric.' But even more important is for agencies to see the big picture of what big data can do."

- Stephen Moore, Chief Technology Officer, AlphaSix



SOLUTION IN ACTION

Transforming Drug Diversion Through Big Data

State and local governments can have a hard time getting a complete picture of drug diversion — that is where, when and how prescription medications are illicitly transferred from their intended user. The data government agencies gather often stops at political boundaries, but drug prescriptions, sales, abuse and overdoses don't adhere to borders.

The datasets that agencies could use to pinpoint drug diversion and secure distribution systems are fragmented and sprawling. Federal agencies hold some data, and many states and localities collect their own information. Additionally, manufacturers, distributors, pharmacies, doctors, hospitals and others also report data related to drug diversion and its consequences. Quality and accessibility of all these datasets vary.

“All the available, relevant data hadn't been incorporated into a modern framework where it could be analyzed,” Moore said. “Agencies are getting only a small, narrow view of the information they need to tackle the problem of drug diversion in their communities.”

AlphaSix's framework can perform analysis across multiple sources of data about the pharmaceutical supply chain and indicators of controlled substance use. Then AlphaSix's anomaly-detection solution, Qato, can automatically flag suspicious activity indicating possible drug diversion, or analysts can perform manual searches for areas of concern, all in a matter of minutes or hours. Agencies can use the insights this multi-source analysis reveals to better detect and prevent drug diversion.

HOW ALPHASIX HELPS

AlphaSix helps local, state and federal governments use big data purposefully. It works with agencies to capture, secure and leverage strategic data assets to transform that information into timely, meaningful insights.

“At AlphaSix, we've come up with a framework that consists of several underlying technologies that help agencies intake and store data, and then make it more analyzable,” Moore said. “The framework is versatile and works with whatever types of data you want to load into it. We understand the government environment and can adapt the

framework to provide intelligence about all types of challenges.”

Part of AlphaSix's analytical framework is a flexible, scalable architecture that uses machine learning to detect anomalies in big data over time.

Agencies can turn to AlphaSix for support with mission-critical work such as fraud detection, compliance, efficient resource management, service delivery and other public-sector applications.

For more information, visit alphasixcorp.com.

Conclusion

Big data is here to stay — and that’s a good thing for government agencies. The technologies that facilitate big data analysis have been tested, proven and scaled. With this maturity, it becomes a matter of getting the most value out of big data for your agency by applying analysis to mission-critical needs in creative ways.

Agencies can start with a smaller batch of data to test a big data framework’s ability to reveal insights. Or they can dive right in and use the framework to strategically address complex problems that require the analysis of huge datasets. At whatever level you need, the time is now for agencies to implement big data solutions.



ABOUT ALPHASIX

AlphaSix Corporation is a data management company. Our mission is to provide targeted IT solutions to the Federal Government that enables management of data and IT infrastructure while improving operations, understanding threats, and reducing costs.

Learn more at alphasixcorp.com.



ABOUT HPE

Hewlett Packard Enterprise is the global edge-to-cloud Platform-as-a-Service company that helps organizations accelerate outcomes by unlocking value from all of their data, everywhere. We’re built on decades of reimagining the future through innovation.

Learn more at:
<https://government.b2b.hpe.com/hpe/>



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 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 connect and improve government.

For more information about this report, please reach out to info@govloop.com.



1152 15th St. NW Suite 800
Washington, DC 20005

P: (202) 407-7421 | F: (202) 407-7501

www.govloop.com
@GovLoop