

**DO MORE WITH
YOUR DATA.
DO MORE WITH
YOUR FUTURE.**

Government of the Future

Governments are entrusted by the people to provide for their general welfare and to do so responsibly. The policies and operations for government agencies of the future will be informed and driven by rich and trusted data.

Governments will find better and more accurate ways to use data for implementing evidenced-based policymaking, identifying fraud, improving customer experiences, and streamlining operations. Sometimes this same data must also be made available to the public. Using data to improve government operations requires moving from a siloed, proprietary, and retrospective approach to a unified, available, and answer-oriented model that makes data the central focus of the agency. Every decision, every pivot, every objective, and every move should be driven by data.

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In a Government Analytics Survey by John Hopkins, REI Systems, and ACT-IAC, only 18% of respondents said analytics, data, and evidence played a dominant role in their organization's three most significant policy or program strategy decisions. The government agency of the future will leverage data for every decision.

The government agency of the future will use data as an asset to see, understand, and plan not only for what's happening now, but what will happen next. Agencies that recognize this critical success factor will be able to more efficiently and effectively improve the lives of the people they serve.

The Future of the Analytics Ecosystem

Rapidly growing data volumes coming from more sources than ever and rapidly changing technologies have presented both challenges and opportunities. Government agencies that rose to the challenge by using scalable technologies to capture, manage, and optimize data to drive innovation and decision making have emerged stronger. These agencies are able to harvest and use detailed data coming from many different sources. They're also able to use many different technologies to make sense of the data, and they're able to host data solutions on new platforms including virtual machines and the cloud.

Data volume, velocity, and variety are constantly increasing. Agencies of the future must collect all the detailed data, which could include hundreds of millions of transactions per day. Decisions will need to be instantaneously informed with data—decisions that could involve admitting a patient to the hospital or stopping a fraudulent claim. Being able to make these instantaneous decisions requires loading and processing data as quickly as possible, in near real time.

Data will come into the agency in a variety of formats, including structured, semi-structured, and unstructured data. Some data will be useful to a broad audience, and some will be useful to only a few people. Agencies of the future must find ways to enable access to different curation levels of the detail data. For example, data scientists may want access to raw phone conversation

transcripts from contact centers, while executives may want access to highly curated data summarizing the call interactions. Government agencies of the future must find ways to process large volumes of disparate data quickly to provide real-time decision-making capabilities.

Analytic techniques such as data visualization, machine learning, and deep learning have existed for years. Analytic tools have made it easier to leverage these analytic techniques. There are many analytic tools on the market, and no single tool is best for everyone. Government agencies must provide flexibility to enable their personnel to use the tool of their choice to analyze data.

Knowing the importance of processing large data sets to answer complex questions, government agencies must be able to scale quickly to address emerging needs such as the COVID-19 crisis. They must also be flexible enough to adapt to changing technology and technology preferences.

A modern cloud architecture helps futureproof organizations by providing the flexibility and portability to deploy anywhere and anytime, without being locked into a single cloud or architectural choice. The cloud enables easy access to unlimited and independent compute and storage, delivers the scaling and elasticity organizations need, and does all of this with less management overhead. As cloud transformation continues to accelerate, only a connected multi-cloud data platform can equip government agencies to thrive in a future full of opportunities.

Data Transformation Advances the Agency and Technology

Data transforms government organizations in two ways (Figure 1). The first is an agency transformation. This entails agencies shifting from a traditional approach to one focused on future capabilities. It involves moving from:

- Experience-based decision making to evidence-based decision making

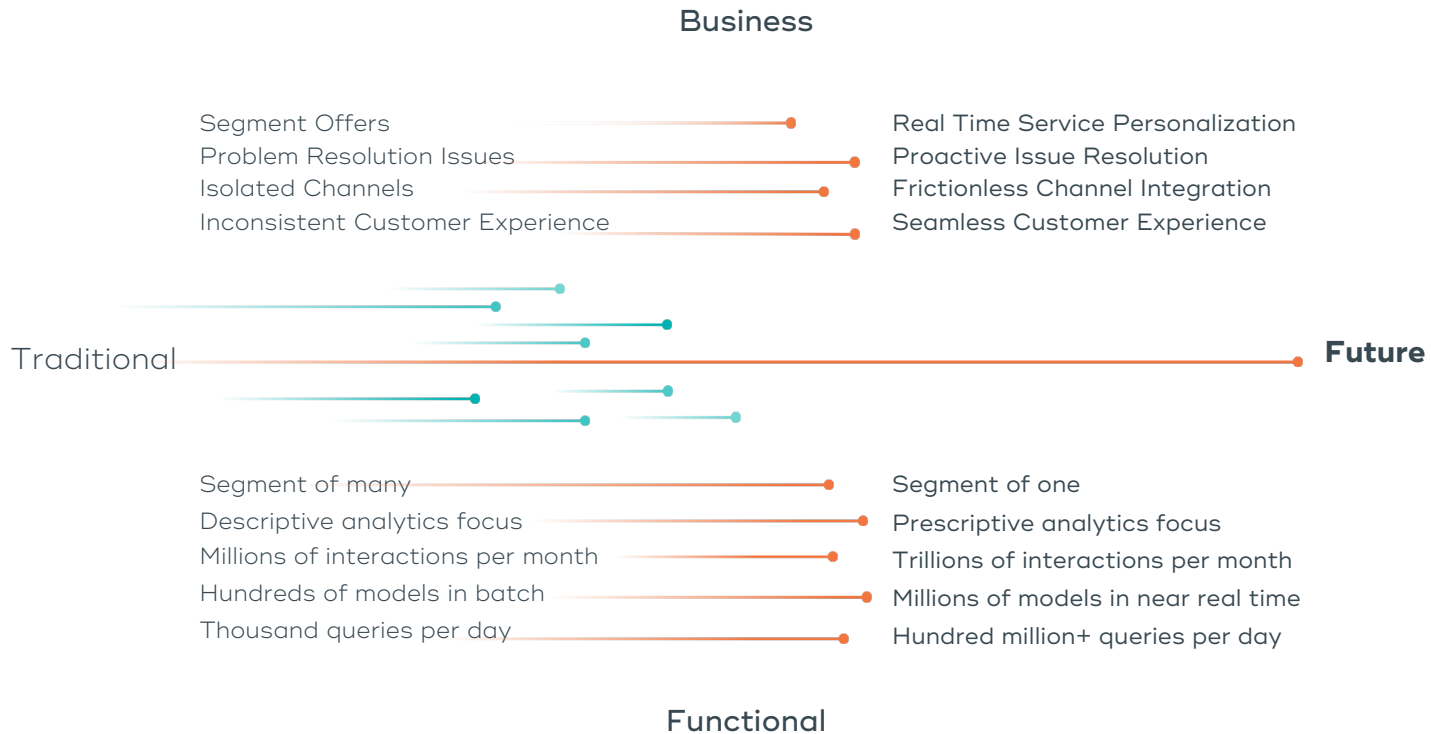


Figure 1: Driving Data Transformations Across Agencies

- Dealing with problems once they arise to proactive problem resolution that solves them before the users or the agency knows they're happening
- Broad-based approach to real-time service personalization at the individual level
- Channels being isolated to frictionless channel integration where each channel is aware of user interactions across other channels
- An inconsistent user experience to a seamless integrated user experience.

On the functional or technology side, this means organizations need to move from:

- Reporting what happened with descriptive analytics to combining descriptive analytics with predictive and prescriptive analytics to project what will happen next and take action
- Millions of interactions each month to trillions of interactions per month
- Hundreds of models in batch to millions of models in near real time
- A thousand queries per day to more than hundreds of millions of queries per day

Agencies of the future must have a future-ready data analytics platform that makes these capabilities possible. These agencies are about the cloud, hyperscalability, and the ability to analyze all available data.

Best-in-Class Is Not Good Enough

Investing in data analytic solutions to become best-in-class is the wrong approach when the demands of hyperscalability, complexity, and speed increase exponentially each year. Organizations that design for best-in-class and are trying to figure out the best way to store data at the cheapest cost, focusing on improving the capabilities of a single departmental silo, or looking at a specific feature are not planning for the future.

An agency of the future re-envision the ongoing data journey. These agencies equip themselves now for the rapidly expanding demands ahead. They design the data journey with the future in mind—a future where levels of personalization drive all the way down to everything from a 360-degree view of their citizens to global pandemics.

The various ranges of data drive millions of models each day to deliver relevant interactions (Figure 2). There is already a significant gap between traditional agencies and best-in-class agencies. For example, data analytics deployments for traditional agencies typically support about six major applications along with active users measured in the hundreds. The total user population is measured in the thousands, with a typical query load in the tens of thousands to hundreds of thousands range.

Traditional systems often have 98 % availability. Many agencies are experiencing a step-change across all measures. They require even higher availability because their mission-critical systems are directly embedded in operational processes.

Moving from a Traditional to a Future-Ready Agency

Evolving from a traditional enterprise to an enterprise of the future entails:

- Bringing together and analyzing all available data
- Focusing on descriptive, prescriptive and predictive analytics
- Targeting a single customer with personalized service offers
- Performing more than 100 million queries per day
- Running over 1 million models, mostly in real time
- Enabling trillions of interactions each month

Figure 2: Agency Analytic Characteristics

Traditional	Best-in-Class	Future
Analytics is not a priority	Management: C-level top priority	Management: Secretary top priority
Descriptive analytics	Predictive analytics	Prescriptive analytics
Data used for reporting	Data used for decision making	Analytics integrated into operations
Data held within programs or silos	Key data is integrated within the agency	Agency data integrated across agencies
Program centric	Customer data integrated with program data	Customer-centric operations
Customer data in silos	Customer experience integrated into operations	<ul style="list-style-type: none"> Analytics: Understanding the customer journey across multiple channels Hyper-personalized and contextual interactions
1,000+ users	10,000+ users	Millions of users and customers
Millions of queries	1,000s of analytic models created	Hundreds of thousands of analytics models scored daily

Some data-driven agencies such as Veterans Affairs will go beyond best-in-class to process hundreds of millions of queries per day just to run personalized care for veterans. Their data analytics platform will need to be open to partners and suppliers—and potentially to customers—with total numbers of users measured in the millions, even if some users are infrequent.

Government agencies will become 100% data driven with end-to-end process alignment. Government organizations can see where they fall in their analytic maturity by asking themselves these questions:

- **Mission:** How well are the agency's data analytic capabilities aligned to the mission and strategy?
- **Outcomes:** What areas of use and level of value are data analytics currently delivering?
- **Governance:** What scope of controls, management, and processes enables the organization's data analytic capability?
- **Information:** To what extent do the organization's data capabilities meet analytic objectives?
- **Applications:** How do the organization's applications affect the ability to deliver meaningful analytics?
- **Systems:** What system infrastructure capabilities deliver effective analytic outcomes?
- **Culture:** To what degree is the organization evolving into a data-driven agency?
- **Agility:** To what degree is the organization able to adapt to changing circumstances?

The Future Belongs to Those Leveraging Analytics

Governments have realized the benefits of shifting from traditional analytics to predictive and other advanced analytics such as artificial intelligence (AI) and machine learning. The agency of the future takes the next step. It not only employs analytics to alert the agency about what’s going to happen next, but it uses predictive and prescriptive analytics to take autonomous action. The analytic continuum starts with descriptive analytics and progresses to predictive and the prescriptive analytics (Figure 3).

It’s not just about agencies using their own data. Government agencies of the future will ingest, integrate, and incorporate external data along with their internal data.

This allows organizations to get both “insights” and “outsights.” Insights are achieved when agencies analyze their own data, which helps drive the agency. The drawback is these insights fail to put an

organization’s operations, situation, or future into the global context where it belongs.

Outsights are even more valuable. They’re derived from more data from more data sources for richer insights. The difference between insights and outsights is like the difference between a microscope and a telescope. Microscopes are great for diagnosing, but telescopes provide the ability to anticipate and plan ahead.

A shift to integrating all data, inside and outside the organization, and getting insights from a modern data analytics platform that enables agencies to hyperscale their processes will enable government agencies of the future to harness their data and take actions that were not possible until now. Examples of how government agencies can use data include:

Fraud. To identify fraud, government agencies of the future will tie together detailed data from across the organization to create a 360-degree view of the agency. Fraud analysts must join the agency data with external data to further enrich the data sets. Analysts must use a wide variety of analytic techniques

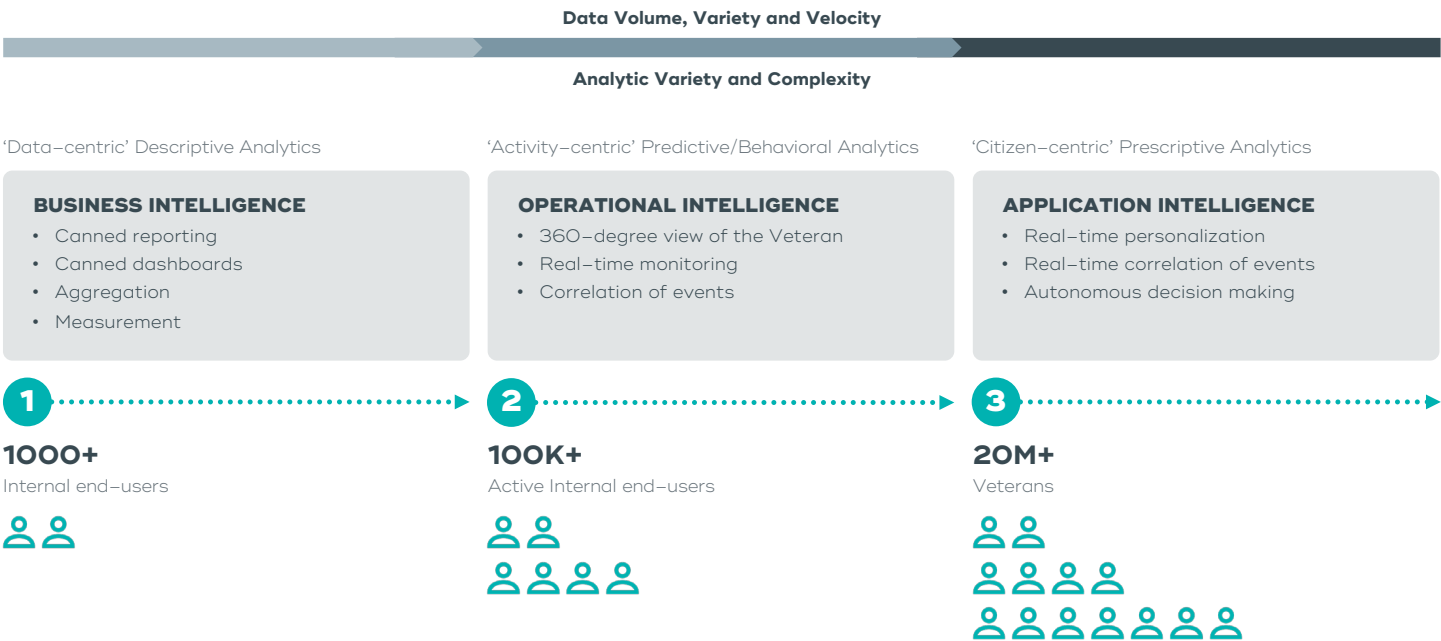


Figure 3: Moving Along the Analytic Continuum

Figure 4: Evolving from Descriptive to Prescriptive Analytics

	Descriptive	Predictive	Prescriptive
Contact Center	Who is contacting the agency? What are they contacting the agency about?	Based on program information, who is going to contact the agency? When will there be peak engagement?	Can the agency reach out to people before they contact the agency? What should the agency tell someone during the engagement?
Asset Management	How much inventory exists? What needs to be replaced?	What is about to break? What will inventory levels be in the future?	How much inventory should be on hand? When should an asset be replaced?
Fraud	What fraud was committed? What was the cost of the fraud?	Who is likely to commit fraud in the future? How much will the government lose to fraud?	Can we prevent fraud from occurring while it's happening?

to identify the fraud. These techniques may include building supervised analytic models and scoring those models against the entire dataset. Agencies of the future will deploy these models into the operational systems and score the models against the rich agency datasets to stop fraud while it's happening.

Supply Chain. Government agencies of the future will manage assets through analytics to optimize the acquisition, operation, maintenance, renewal, and disposal of organizational assets. Optimizing these processes improves the delivery potential of assets and minimizes the costs and risks involved. Government agencies will use dynamic supply chain analytics to gain an understanding of what's happening in the supply base, such as inventory for parts in-house and supply base preparedness to supply additional parts, to prepare for changes. The analytics can forecast the future, warn about potential supply or inventory risks, and recommend a course of action, such as expediting an order for replacement inventory or securing additional supply from another source.

These agencies will also use predictive analytics to assess risk of actual equipment conditions by collecting equipment activity, usage, and condition, via historical replacements, maintenance, and sensor data, to assess whether assets are nearing a risk of failure. The analytics will recommend a course of action

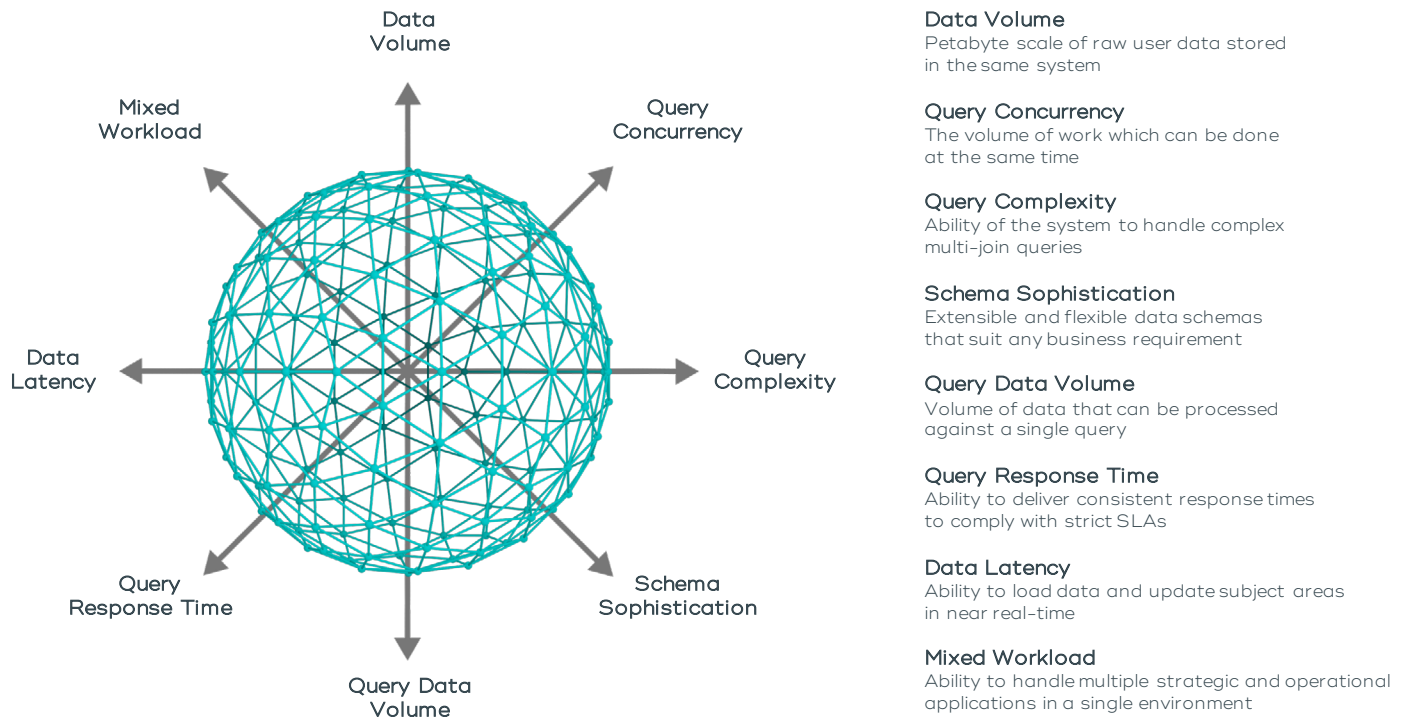
such as extending or shortening the waiting period for equipment maintenance.

The “condition-based, predictive” approach to the timing of maintenance and repair requires a mindset shift from time-based maintenance policies, such as every 5,000 miles or every six months, to a more dynamic, information-intensive process.

Contact Centers. Government agencies of the future will optimize data to understand customer behaviors in an online world. An agency with 10 million people served across an average of six programs and four types of interactions will gain significant insights with a modern data analytics platform that is hyperscalable. Data mapped against a customer journey of acquisition, services, and churn could drive nearly 120 million models per day for every interaction.

These models can be used to predict customer interactions and prescribe actions to improve the customer experience. Improving program participation by 10% per 10 million people means 1 million people are better served.

Figure 5: Eight Dimensions of Scalability



Data Orchestration at Hyperscale is the Key to the Future

To achieve high-value results, government agencies of the future must take an orchestrated approach to data analytics to solve current and future problems, and drive informed, actionable decision making. This approach allows the agency to reuse data as part of a modern, powerful data analytics ecosystem that orchestrates every action and initiative to drive growth and value.

Data analytic orchestration will incorporate many systems, functions, and data types. It will rely on a platform that enables multidimensional scalability across eight core dimensions (Figure 5).

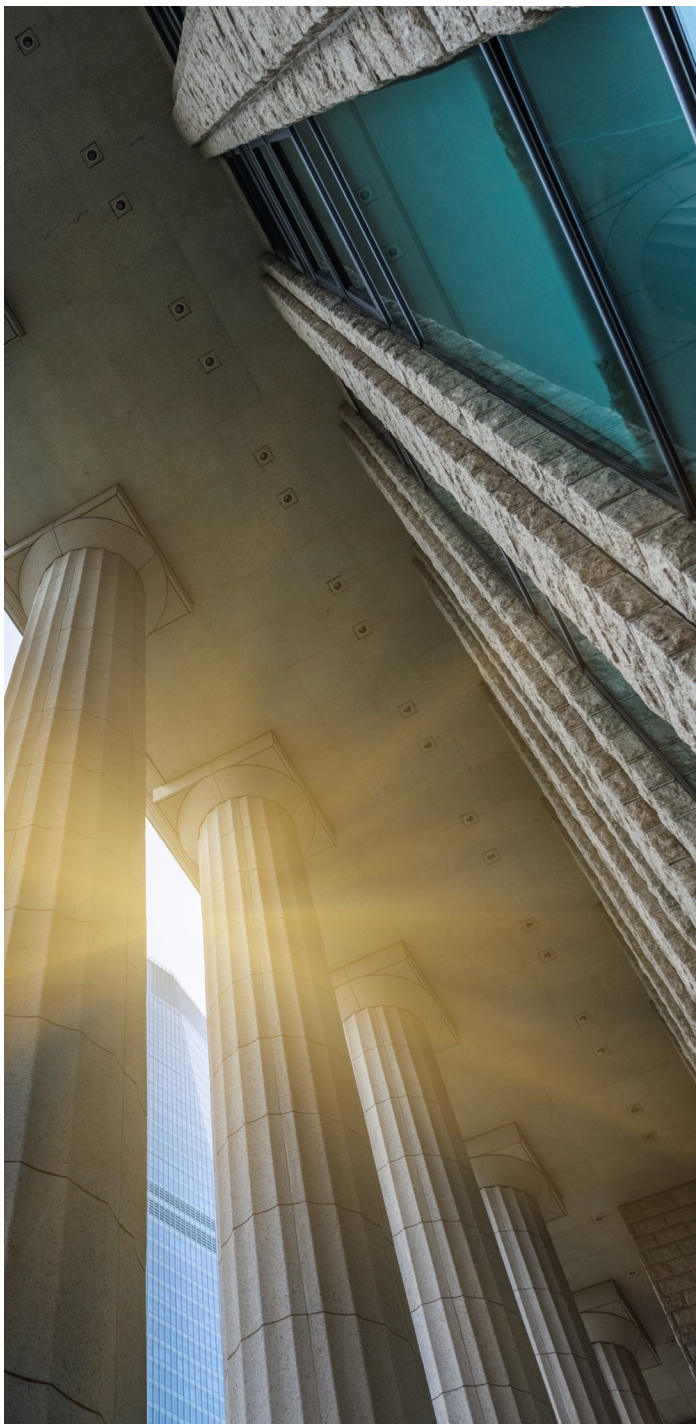
The dimensions are:

- Data volume
- Query concurrency
- Query complexity
- Schema sophistication

- Query data volume
- Query response time
- Data latency
- Mixed workload

This multidimensional scalability delivers the advanced capabilities government agencies of the future need to run millions of productionized models on trillions of interactions, every second of every day. This gives agencies insights and answers that were previously impossible to achieve.

Agencies can accomplish this with the Teradata Vantage™ connected multi-cloud data platform for enterprise analytics. It has the essential ability to hyperscale to support the larger, more complex data sets of the future. Vantage delivers value at a scale that's unlike any other technology. As a cloud-first company, Teradata provides the fastest path to cloud modernization at the lowest cost per query and delivers the leading multi-cloud data platform from start to scale on Azure, AWS, and Google Cloud.



The future belongs to government agencies that put data at their heart of their operations and let it drive every action. Government agencies that continue to integrate more data and push it harder for more insights can see their future and chart their own course.

About Teradata

Teradata is the connected multi-cloud data platform company for enterprise analytics, solving data challenges from start to scale. Only Teradata gives you the flexibility to handle the massive and mixed data workloads of the future, today – making data easier to consume everywhere, with no added risk.

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