HURDLES

OVERCOMING DATA CHALLENGES

Leveraged correctly, big data and analytics provide the opportunity for state and local governments to revolutionize day-to-day operations, citizen interactions, and community health and safety. However, with every advancement comes challenges — with the right technologies and teams in place, these challenges can be overcome.

Data Quality, Governance & Management

Thirty-nine percent of CDG survey respondents reported data quality as a challenge in big data and analytics initiatives. The growth of big data and analytics will depend to a large degree on the quality, governance and management of data.

Not all data has to be top quality to be part of a big data project — the purpose, magnitude and desired outcome should be taken into consideration. High-quality data can be expensive to produce and maintain, so imposing exacting standards on data quality for a project that does not require high levels of security, authentication and authorization may make it unaffordable. But there needs to be some baseline standards. Also, once the data is created, it's important that the quality is not diluted as it is aggregated, shared and analyzed.[46]

Data quality control requires governance and good management of data. This ranges from the ability to inventory and identify critical data for analytics projects to data ownership — specifying rights and accountability — to ensure data is properly stored, archived and, when necessary, deleted.

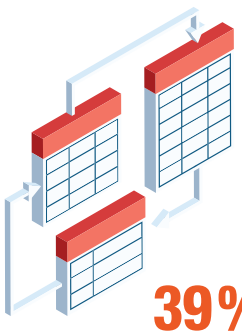
Governance can be challenging in the field of big data because it's broad and must take employee accessibility, eDiscovery and metadata management, and data compliance issues into consideration. To help alleviate the problem at the federal level, the Office of Management and Budget (OMB) published a series of guidelines and recommendations on how agencies can improve their digital governance. These recommendations call for:

- ✓ Gathering a core team with an established leader
- ✓ Assessing existing governance structures
- ✓ Determining the ideal governance structure
- ✓ Building and validating the new governance structure
- ✓ Sharing, reviewing and upgrading the proposed governance structure
- ✓ Establishing the new structure

The guidelines include best practices to help agencies develop or strengthen their governance structures across all three layers of digital services: information, platform and presentation.[47]

Cost and Funding

One driver behind the big data and analytics trend is technology. More specifically, the lower cost of technology. Open source platforms for big data storage and processing are oftentimes a less expensive alternative to enterprise data warehouses, commonly quoted at less than



39%

OF CDG SURVEY RESPONDENTS REPORTED DATA QUALITY AS A CHALLENGE TO THE IMPLEMENTATION OF A BIG DATA INITIATIVE.

SOURCE: CDG DATA AND ANALYTICS SURVEY, 2015

$1,000 per terabyte.[48] This low-price entry point could change the minds of the 42 percent of CDG survey respondents who said cost issues were the biggest challenge to a big data project.

But technology is a fraction of the total cost of any IT project. For years, experts have pegged hardware and software at just 15 percent of a project's overall expense. The other 85 percent is eaten up by a range of administrative, personnel and support costs. Costs can also rise according to the quality of data needed for a particular big data project.

Skillset Requirements

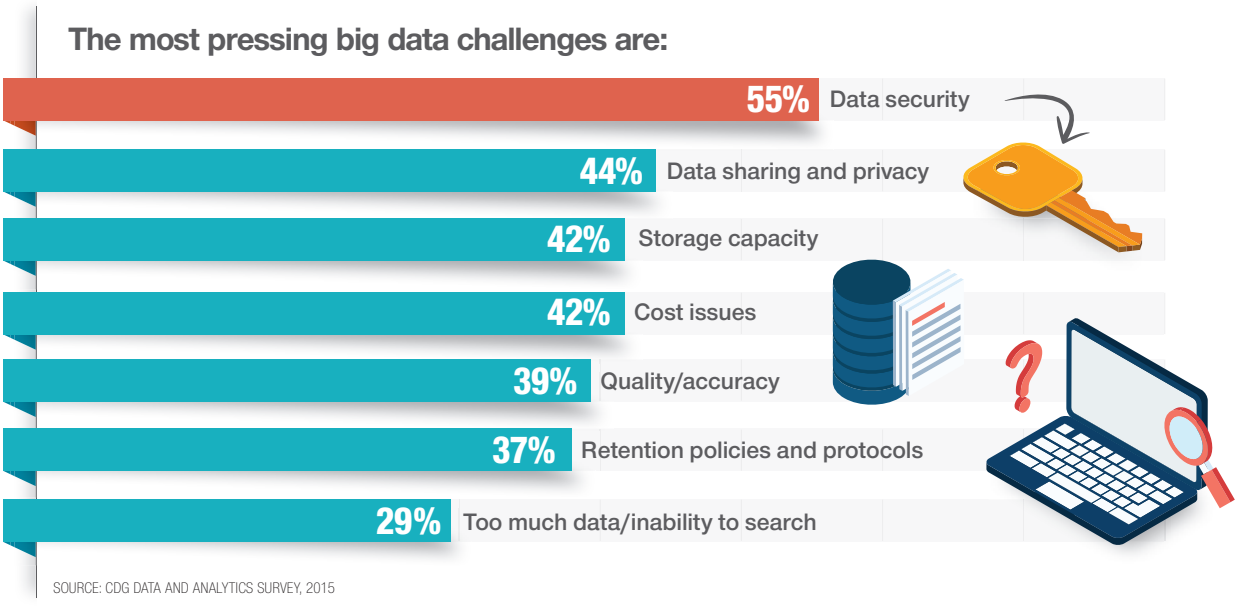
When it comes to big data and analytics, state and local governments need more analysts, data scientists and chief data officers. Various reports estimate that by 2018, as many as 190,000 big data experts will be needed across the public and private sectors.[49]

Industry experts who work with states and localities on big data projects call the skillset gap a major issue. While localities have made progress in finding and hiring data experts, some jurisdictions struggle to acquire the right talent, given the limited supply. To fill the gap, technology companies and public policy firms are offering consulting services.

Some localities have also solved this challenge by consolidating talent. For example, the city of Jacksonville, Fla., created a business intelligence (BI) group within the IT department that develops BI applications for the city's agencies.[50] By leveraging existing talent and resources, state and local governments can meet unique business requirements using a common framework.

Johns Hopkins University launched a graduate program in government analytics to meet the high demand in government for people with quantitative skills. "The public sector needs people who have the skills and knowledge to make sense of all this new information," says Dr. Bachner of Johns Hopkins.

While Johns Hopkins' program is unique, other universities are also establishing coursework that will equip students with data analysis skills. New Orleans' Wise noticed the trend at nearby Louisiana State University. "I'm bullish about the talent that's available to city and state government when it comes to getting top notch analytical talent in the door," he says.



TIPS

10 STEPS TO SUCCESS

1 **Get buy-in from key stakeholders.** Work with key decision-makers such as city council members, mayors and other elected officials to ensure support through every step of a new data initiative.

2 **Create a business case to justify new investments.** You will need to prove why a data initiative is necessary before securing stakeholder buy-in. Outline your initiative's cost, projected return on investment and potential efficiencies when developing a business plan.

3 **Create a data management plan.** Prior to launching a data initiative, determine what data you plan to collect and exactly how you plan to use it.

4 **Bridge technology and mission activities.** Collaborate with program managers to understand how big data can enhance mission goals. Learn the most important questions to ask for fulfilling missions and use these results to guide analytics implementations.

5 **Create an IT infrastructure that fully supports big data analytics.** Consider features such as in-memory computing for a solid analytics foundation. The technology you implement will need to efficiently consolidate large volumes of data from multiple sources and aggregate information into a single database for significantly faster response times to queries. Your infrastructure should be scalable as your data grows.

6 **Focus on data quality.** Regardless of quantity, inaccurate data is not reliable and can lead to poor decision-making — this makes data governance a crucial aspect of any data initiative. Examine internal governance policies and make governance tools a key criteria for evaluating analytics solutions.

7 **Re-evaluate internal business processes.** Examine existing business processes to identify and address bottlenecks so stakeholders can act quickly on new insights as they arise.

8 **Tap into specialized expertise.** Data scientists play increasingly important roles as experts who can bridge technical and business departments. Look to universities for potential new employees and professional development organizations for continuing education opportunities for existing staff.

9 **Start small.** Launch a pilot to determine which data and analytics processes work and don't work. Build on successes by rolling out analytics to additional stakeholders.

10 **Stay nimble.** Robust and nimble architectures, processes and philosophies are vital to avoiding building tomorrow's stovepipes today. Stay flexible and expect the unexpected.