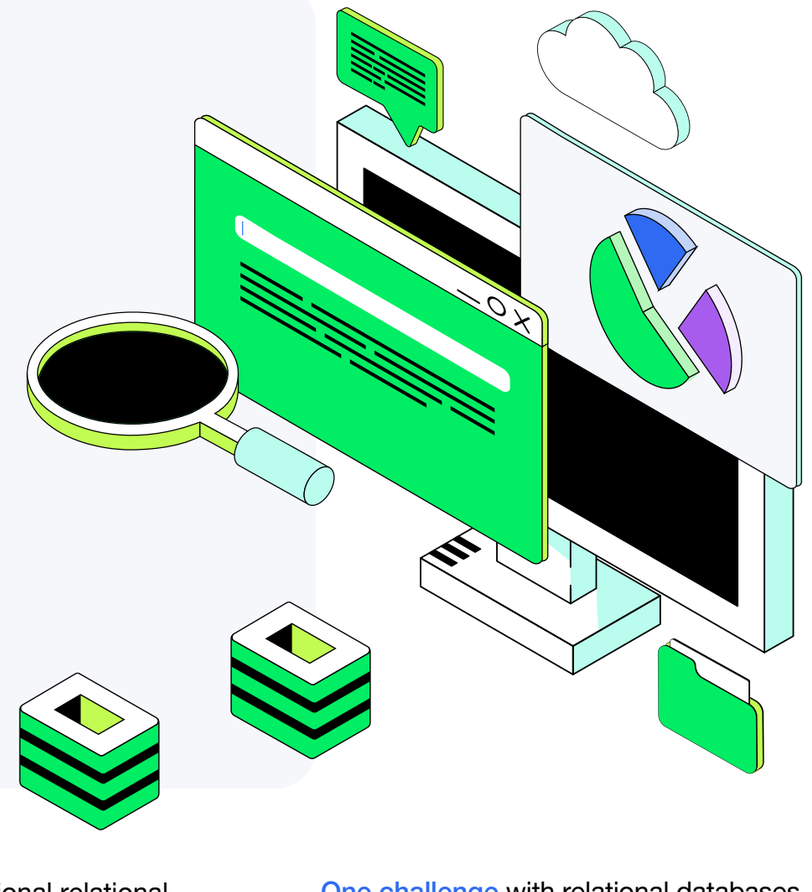
MongoDB Atlas for Government:

Creating agility to capture the power of public sector data at scale

How MongoDB's high-performance database platform on AWS is revolutionizing agencies' ability to manage and scale their data more effectively.



By Scoop News Group

Government agencies today are drowning in data. Whether it concerns economics, health, the environment, national security, law enforcement or military logistics, or keeping track of federal grants, tax revenues or social security, government agencies generate or manage petabytes or even exabytes of data daily.

Yet the ability to effectively leverage this data — to extract insights, automate processes, and innovate in service delivery — consistently lags behind the ability to process it.

What's the problem?

A significant portion of this gap is due to the growing diversity and sheer volume of unstructured data that agencies collect and process. This includes information embedded in text documents, images, videos, audio files, surveillance footage, presentations, emails, social media, and sensor data.

Traditional relational database systems — the backbone of federal data management — were never intended to accommodate such a broad spectrum of data types.

In perspective: "Traditional relational databases have been around for 50 years," notes Gary Taylor, who has worked with databases for over four decades and currently serves as advisory solutions architect at MongoDB. "But then the internet and the World Wide Web happened. Now you've got all sorts of different data coming at much faster speeds — and they are no longer just for back-office applications. While relational databases are great, and they can do a lot of things, there are better tools for developing today's applications to handle data."

One challenge with relational databases, which store data in rows and columns in multiple tables, is that as data volumes grow, so does the complexity of joining data tables together using structured query language (SQL). "Relational databases were created in the day when storage was very expensive," explains Taylor. "In today's world, storage is not expensive at all." Yet agencies pay a growing cost as system performance degrades, data volumes expand, and data is increasingly distributed across multiple clouds.

The alternatives: Fortunately, alternative (or NoSQL) database platforms have evolved and matured — including document databases, time-series, graph and object databases, as well as sophisticated search engines — which can help agencies more effectively manage structured and unstructured data.

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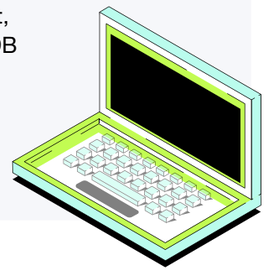

Document databases like MongoDB, for example, which use JavaScript Object Notation (JSON) — an open-data interchange format that is lightweight, human and machine-readable, and language-independent — have grown in popularity, particularly with enterprise application developers. Among other advantages, they allow:

- **Greater flexibility** – Document databases don't need a predefined schema so that each document can have its own unique structure; fields can be added, changed or adapted without disrupting existing data; and they are language independent.
- **Variable data** – They can accommodate a broader range of data types with different attributes.
- **Faster iteration** – This flexibility facilitates rapid prototyping and revisions compared to relational databases, which require "alter table" statements, regular updating and potential data migrations.
- **Reduced complexity**—JSON minimizes the need for Object-Relational Mapping (ORM) layers, which translate between object-oriented code and a relational database structure, increasing development speed and agility.
- **Improved performance** – Document databases can store related data within a single document, avoiding expensive join operations and significantly improving read performance, especially for hierarchical data.
- **Broader scalability** – Document databases can be seamlessly scaled horizontally or sharded by adding more servers to handle increased workloads without significant performance degradation. When relational databases grow, they require vertical expansion by adding more powerful and costly hardware to existing servers.

While relational databases have historically been favored for scenarios emphasizing data consistency, formalization, and static applications, MongoDB offers a modern, flexible alternative that meets these needs while also providing additional advantages that relational databases struggle to match, for example, when dealing with:

- Applications with rapidly evolving data structures.
- Data that is naturally hierarchical or nested.
- Read-heavy workloads.
- Applications requiring high scalability.
- When development speed and agility are paramount.
- When dealing with semi-structured data.
- When working with geospatial data.

Moreover, MongoDB excels in these scenarios and adapts to any workload — structured or semi-structured, read- or write-intensive, static or evolving — delivering speed, scale and reliability that liberates developers from the constraints of relational rigidity.

The AI factor: Additionally, as artificial intelligence (AI) continues to build on large language models, multi-modal search and machine learning capabilities, agencies wanting to expand their use of AI will come under increasing pressure to harvest a broader spectrum of their data quickly. That will require modern database platforms designed to orchestrate data storage and queries across multiple databases and cloud environments — and that are widely supported by today's application developers.

- **MongoDB Atlas** and Atlas for Government directly address that need with built-in vector search capabilities. These capabilities enable organizations to efficiently store, index, and query vector embeddings alongside traditional data, eliminating the need for separate vector databases.
- Atlas's vector search functionality allows organizations to seamlessly incorporate unstructured data like text, images, and audio into their AI applications while maintaining a consistent developer experience across their entire data infrastructure, simplifying the ability to build more sophisticated AI-powered applications.
- MongoDB is adding to Atlas's and Atlas for Government's capabilities with the recent acquisition of Voyage AI, a pioneer in state-of-the-art embedding and reranking models that power next-generation AI applications. "Integrating Voyage AI's technology with MongoDB will enable organizations to easily build trustworthy, AI-powered applications by offering highly accurate and relevant information retrieval deeply integrated with operational data," said Taylor.

Winning the hearts of developers

One reason document databases have grown in popularity, according to Taylor, is the speed and agility they give developers to build and update applications quickly. Another is the way the document data model maps to how developers think and code.

The agility axiom: Taylor argues that federal agencies can be more agile when their databases are more agile — and agency databases can be more agile when their developers have more agile tools and platforms.

"With the document data model, developers can intuitively conceptualize their applications

using objects in their language of choice," Taylor explains. "There is no need to break the data apart. They don't have to learn SQL, and they don't have to learn joins. Data that is accessed together is typically stored together, so you have less code to write, and your users get higher performance."

What developers prefer: "One of the things that stands out with MongoDB is that it's really popular among developers," observes John Foley, an industry analyst and editor of the Cloud Database Report.

"As Mongo's people like to say, 'MongoDB was built by developers, for developers.' That's one of the reasons sometimes businesspeople may not fully appreciate the platform, because it's geared to the developers." But they should: "It's particularly well-suited for agile prototyping and iteration and for getting projects moving forward quickly."

"There are literally more than 1,000 different databases out there. I think it's safe to say there are between 50 and 100 document databases, but MongoDB would have to be considered the leader."

Others concur: Gartner named MongoDB a "Leader" in the 2024 Gartner Magic Quadrant for Cloud Database Management Systems for the third consecutive year. MongoDB was also recognized in 2024 for the second straight year as the "most loved vector database" in Retool's State of AI report. (Vector databases specialize in embedding numerical representations of images and other unstructured media into digital artifacts, making it possible to identify similar or identical artifacts in seconds.)

What management needs to know: As government executives grapple with growing pressures to manage their agencies' data more effectively, it's increasingly important they have a fundamental understanding of the database platforms that store and analyze their agency's data. It's also important they understand how the changing IT landscape, including the coming demands of AI, will impact data operations.

Distributed data goes mainstream: "Thinking back to 2024, one of the things that is noteworthy is that this whole idea of 'multi-cloud' became mainstream," notes Foley. "What we saw happen was all the database companies recognized that they need to be available on all the clouds — and the hyperscalers recognized they need to make all of the most popular databases available to their customers."

For agencies, the takeaway is to ensure their databases can not only continue delivering the flexibility and query capabilities they need but that those capabilities can also extend and scale seamlessly into a dynamic, multi-cloud environment. That's where commercial enterprises — and increasingly, agencies — see the growing appeal of MongoDB.

MongoDB's multi-modal advantage: Since its founding in 2007, MongoDB has gained growing recognition for the dynamic nature of its database schema, especially with the rise of unstructured internet and IoT data that cannot be saved in a traditional SQL database. It's also been a boon for organizations that need to store data before they know how it will be used later. MongoDB's reputation as an innovator has continued to grow with its introduction of:

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- **A universal document data model** – that extends the range of data that can be stored and queried, including rich objects, key-value pairs, tables, and geospatial and time series data.
- **A multi-cloud global operating environment** – that gives developers the freedom to run their applications anywhere and the flexibility to move across private and public clouds as requirements evolve — without changing a single line of application code.
- **A unified experience for developing modern applications** — backed by comprehensive and integrated developer services.

In October, the company released MongoDB 8.0, which performs over 30% faster than the previous version and operates more securely than ever, according to company officials. It also makes horizontal scaling faster and less costly and gives IT teams greater control over optimizing database performance.

Advances in database services: Similarly, MongoDB has launched groundbreaking services designed to help enterprises master data management across today's multi-cloud world that will be increasingly important in the AI age, including:

- **MongoDB Atlas's cloud-native architecture** – which provides enterprises with MongoDB database capabilities as a service in partnership with hyperscalers such as Amazon Web Services (AWS) – delivers whatever scale and resilience they need by automating scaling and performance optimization functions.
- **MongoDB Queryable Encryption** — an industry-first capability that allows customers to encrypt, store, and perform queries directly on data.
- **MongoDB Atlas's integrated capabilities** — which support multi-modal data types and use cases — such as full-text and vector search, stream processing, and data federation — helping organizations power

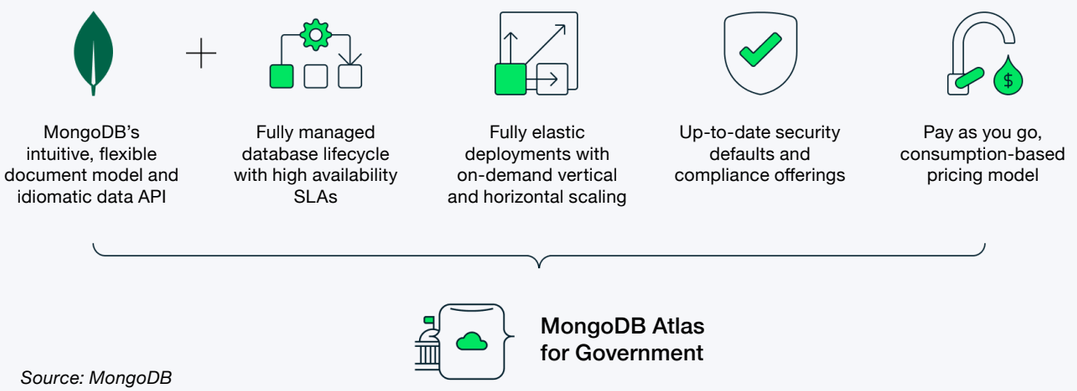
AI-driven insights and improve digital experiences with their end users.

MongoDB Atlas for Government:
Of particular importance to U.S. government agencies is the continuing evolution of MongoDB Atlas for Government, which achieved FedRAMP Moderate authorization a year ago. Rather than having to stand up, configure and maintain MongoDB instances in-house, agencies can securely deploy, run and scale most of Atlas' key capabilities as a service in the government cloud.

"MongoDB Atlas for Government can automatically scale the system for you," says Taylor. "So if you're seeing seasonal spikes in service demands and need to scale, you check a box that auto-scales the disk and auto-scales the instance sizes. And as the CPUs increase at a certain level and meet a certain threshold, those instance sizes will automatically scale up and down for as long as they need it."

Strategic partnerships: Atlas for Government is powered by AWS and is operated by MongoDB personnel, providing several other advantages for federal agencies:

- **Seamless AWS Integration –** MongoDB's established collaboration with AWS enables integration across key services like AWS Lambda, Amazon S3, Amazon Bedrock, and Amazon Redshift, enhancing MongoDB Atlas's capabilities and providing a cohesive, robust foundation for innovative solutions.
- **Joint innovation –** Collaborative efforts between MongoDB and AWS drive continuous innovation, ensuring government agencies benefit from the latest advancements in cloud technology and database management.
- **Enhanced support and services –** Joint support and professional services from MongoDB and AWS provide government agencies with the expertise and resources to successfully deploy, manage, and optimize their database solutions.
- **Advanced security features –** Atlas for Government includes end-to-end encryption, fine-grained access controls, and comprehensive auditing capabilities that provide robust data protection.



Source: MongoDB

Advancing the missions of government
MongoDB Atlas is already helping government and public sector entities develop advanced data management capabilities to better support:

- **Healthcare:** MongoDB and FHIR (Fast Healthcare Interoperability Resources) are bringing together data from disparate databases, systems, and formats to create a single view of the patient. They are building on JSON to gather and analyze rich data structures and objects prevalent in healthcare, such as patient data, claims, policies, medical devices and treatment information.
- **Government research:** A division of the National Institutes of Health (NIH), working with AWS GovCloud and AWS Partner Govplace, relies on a MongoDB Atlas database to pull and process data from millions of grants, journal articles and patents. Leveraging natural language processing, the system helps NIH scientists and program managers in the NIH Office of Portfolio Analysis quickly search global biomedical research to make better investment decisions.
- **Financial services:** Agencies participating in financial services activities must fully commit to digital transformation. Atlas for Government is helping to liberate data and empower developers to keep up with the expectations of AI/ML-driven fraud detection systems, instantaneous transactions, and end-to-end digital loan origination.

At every level, Federal, state, and local government agencies face rising costs, changing regulations, and complex technological demands. Traditional data systems are expensive and ill-equipped to handle modern scale, cost efficiency, and flexibility needs. Atlas for Government opens doors for exploring new initiatives to improve citizen services.

"With Atlas for Government, we take care of upgrading the software for you. When you want to build a cluster, all that networking, all that security, all that is taken care of automatically by Atlas for Government, it's all done for you," says Taylor. "It is truly a database as a service."

Learn how MongoDB Atlas for Government can modernize your data management and insights.

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