



INDUSTRY

Public Sector Research & Development

PROFILE

Established in the 1950s, this is a federally funded research and development center (FFRDC) focused on national security technology. It is one of the most important applied research labs.



Mastering API configurations within the Denodo Platform has been a game changer for us. Before Denodo, this was simply not possible. Now, I can schedule a job to run the APIs and get the data right away.”

— IT Director, Enterprise Data & Analytics

Federally Funded R&D Center Advances National Security through a Unified Semantic Layer

With a legacy of innovation and a mission rooted in national security, this research center has stretched the boundaries of what's possible with technology. From the development of the nation's air defense system to the use of laser communications on the historic moon mission, their researchers have always been proactive in developing new applications.

What sets it apart from other national R&D laboratories is its emphasis on developing working prototypes of its systems. With science at its core, building a solid data foundation to power its many path-breaking initiatives has been table stakes.

This leading research laboratory is unlocking near real-time data capabilities with the Denodo AI Data Layer

Business Need

This public sector undertaking has always been at the forefront of science and technology. However, in recent years, their IT director for enterprise data & analytics and his team, faced the following challenges:



Data silos and fragmentation: Data resided across close to 30 disparate sources, including SAP Business Warehouse, Oracle, SQL database, and various SaaS solutions like ServiceNow, SuccessFactors, and Concur.



Source system overload: Business users were independently accessing the same source systems to retrieve the same information, putting considerable pressure on the underlying databases. This led to redundancy, inefficiency, and performance issues.



API integration and data access complexities: Integrating data directly from a multitude of isolated APIs was a highly complex, tedious, and a time-consuming process. As a result, the laboratory was not able to access and report on data trapped behind various APIs in a timely manner.

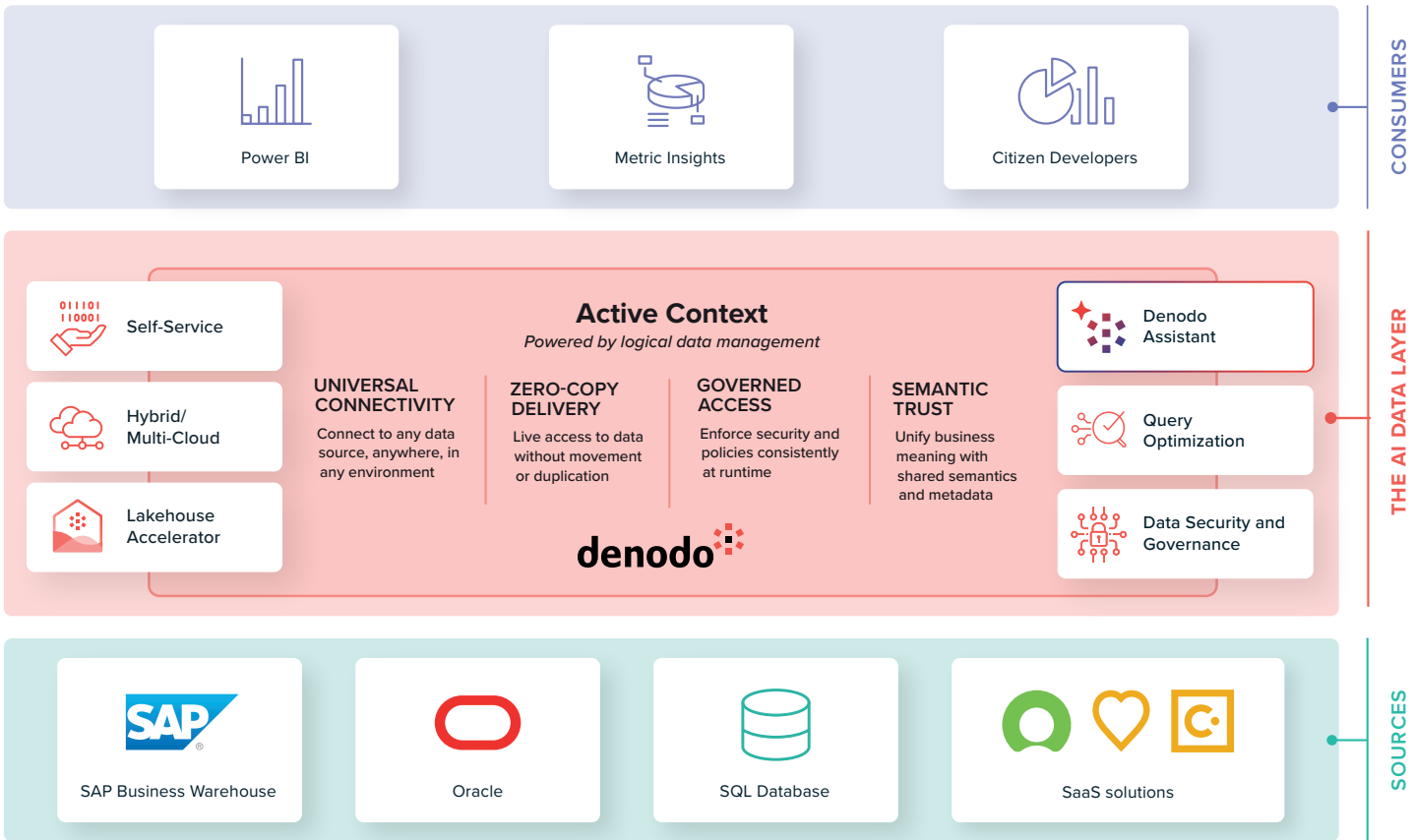
Clearly the research center needed a modern data architecture – powered by a unified semantic layer – to solve for data fragmentation, source system overload, and API complexities.



The Solution

The enterprise data and analytics team at this leading R&D center found their solution in the Denodo Platform, with its unified semantics capabilities, enabled by a logical data management approach. Denodo’s Universal Semantic Layer unifies data from diverse sources into a consistent, business-friendly framework, providing seamless access and accurate insights across distributed environments. For the center, this meant a marked improvement in source system performance and a reduction in operational overhead.

“For us, Denodo’s semantic layer acts as the single version of truth. It effectively bridges the gap between complex backend systems and business-ready insights by transforming raw data into an intuitive and unified interface,” said their IT director.



As reflected in the simplified version of the reference architecture diagram above, the bottom layer comprises a multitude of source systems such as SAP Business Warehouse, Oracle, SQL database, and various SaaS solutions like ServiceNow, SuccessFactors, and Concur. The laboratory has close to 30 different applications running in parallel.

Denodo forms the infrastructure or the AI data layer connecting all of these source systems in real time to deliver business-ready data to all data consumers through the layer above. Denodo democratizes data access and delivery at scale by enabling end users to readily find, integrate, and consume data.

The virtualized data is fed directly into Power BI, which serves as the lab’s primary analytics and dashboarding tool. To further simplify the end-user experience, the lab uses Metric Insights as a centralized analytics portal to hold and categorize all Power BI assets in one place. The consumption layer also includes the Denodo Marketplace, to further improve data access for business users, and Denodo Assistant, for natural language querying.



Benefits

The team at the U.S. government's federally funded R&D center is already seeing some early wins with the Denodo-enabled semantic layer. The lab has established a hub-and-spoke architecture wherein the IT team uses the Denodo Platform to create centralized data views and models, unlocking self service analytics and enabling citizen developers to easily find insights and build their own dashboards.

The key benefits are:



Data Democratization and ease of use: With a modern data architecture in place, the lab's business users can now easily access high quality, trustworthy data, citizen developers can build their own dashboards and data products, and the IT team can deliver near-real-time data by unlocking data in disparate source systems.

The team also noted that since Denodo supports SQL – the lingua franca of data – it did not require extensive retraining of the staff. Given that most users have a standard computer science background, it was pretty simple to use.



Reduced API complexity and system overload: The laboratory achieved a “big victory” by enabling unified access across all of their data sources, which allowed the lab to seamlessly deliver data over a single API. In addition, common views within the Denodo Platform substantially reduced the impact and strain on the source systems, as users no longer need to call data from individual sources. This has led to considerable cost and time savings.



Building towards an AI-driven future: The center began with Denodo Platform 9.4 and started a proof-of-concept phase for the Denodo Data Marketplace and Denodo Assistant, to enable natural language data discovery. It also plans to explore the AI SDK to accelerate agent development.

From an AI perspective, version 9.4 expanded how AI connects to enterprise data by enabling secure integration with vector databases and embedding support for Model Context Protocol (MCP), directly into the platform.

The team considers Denodo a technology enabler for the lab's larger mission of applying advanced technology to national security issues.

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Denodo does a phenomenal job of hiding the architectural complexity of source systems and API integrations. Our IT team uses the platform to create common data views and models, empowering citizen developers to discover data and build their own dashboards.”

— IT Director, Enterprise Data & Analytics

