## PanTEX

**INDUSTRY**
Government

**PROFILE**
Pantex Plant is the production integrator for the U.S. National Nuclear Security Administration (NNSA), as well as a provider of nuclear deterrence solutions for the U.S. Department of Energy. Pantex is the primary nuclear weapons assembly and disassembly facility in the United States and is responsible for maintaining the safety, security, and reliability of the nation's nuclear weapons stockpile. The facility is located on a 16,000-acre site 17 miles northeast of Amarillo, in Carson County, Texas.

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With a long-term mission of safely and securely maintaining the nation's nuclear weapons stockpile and dismantling weapons retired by the military, our data virtualization strategy plays an important role in expediting projects by enabling fast and secure data movement through different facilities"

— **Stefanie Elsea,** Enterprise Architect, Pantex

# Pantex Uses Data Virtualization to Share Sensitive Information across Facilities, to Maintain the Nuclear Weapons Stockpile

Faced with rising costs and increasing security risks, the NNSA established the Product Realization Integrated Digital Enterprise (PRIDE) program to securely deliver weapon product lifecycle information to engineers, scientists, and other users across different sites in North America. Sponsored by the NNSA, and with funding of about $30 million a year, the PRIDE program is a multi-year initiative to develop and manage a portfolio of applications. Nuclear weapon lifecycle management takes places across a number of specialized and security-clearance-driven facilities including Pantex (TX), Kansas City Plant (MO), Sandia Labs (CA), and Y-12 (TN).

## Business Need

The challenges that led to the PRIDE program include:

- Impeded data sharing within and across facilities — Different legacy systems and applications stored data in multiple formats, making information difficult to share. This problem was intensified by the high security restrictions between facilities.
- Delayed data delivery — There was no central repository from which data could be quickly accessed. Information delivery was delayed because of overnight file extract requirements, multiple emails and calls, and a lack of data ownership.
- Governance challenges — Data sharing through email, the lack of a version control system, and document based information sharing, often cut off lineage information and made it difficult to trace data back to its source.
- Security challenges — Across multiple facilities, data in transit was susceptible to breaches.

## The Solution

To address these issues, NNSA planned to build an "Integrated Digital Environment (IDE)" to provide unified access to weapon lifecycle data across different facilities and enable the timely, secure sharing of data.

Pantex migrated data and documents from a legacy Document Management System (DMS) to a Product Lifecycle Management (PLM) solution from PTC Windchill. After the migration of document-based information, Pantex leveraged Denodo data virtualization to set up virtual data marts for downstream users and to feed IBM Data Stage Extract Transform Load (ETL) processes for loading data into the data warehouse.

Pantex Plant works in collaboration with several national laboratories to test surveillance assemblies that are manufactured at Pantex. This process requires Pantex to provide the complete list of assembly components, so personnel at the laboratory can put together

a bill of materials report before the testing process commences. Previously, this information was extracted from an Oracle database at Pantex, copied to a spreadsheet, and emailed to the laboratory, where it was manually entered into a Maximo Manufacturing Resource Planning (MRP) system. Pantex deployed data virtualization to present a normalized view of the as-built component data to several members of the laboratory team. The data virtualization platform plugged into the source databases, extracted data for the necessary equipment parts and sub-assemblies, and published this data as a secure SOAP web service, that could be easily accessed by laboratory engineers.

Self-service analytics also plays an important role at the Pantex. Through an Information portal, users can log in and query the data without tampering with the operations of source systems.
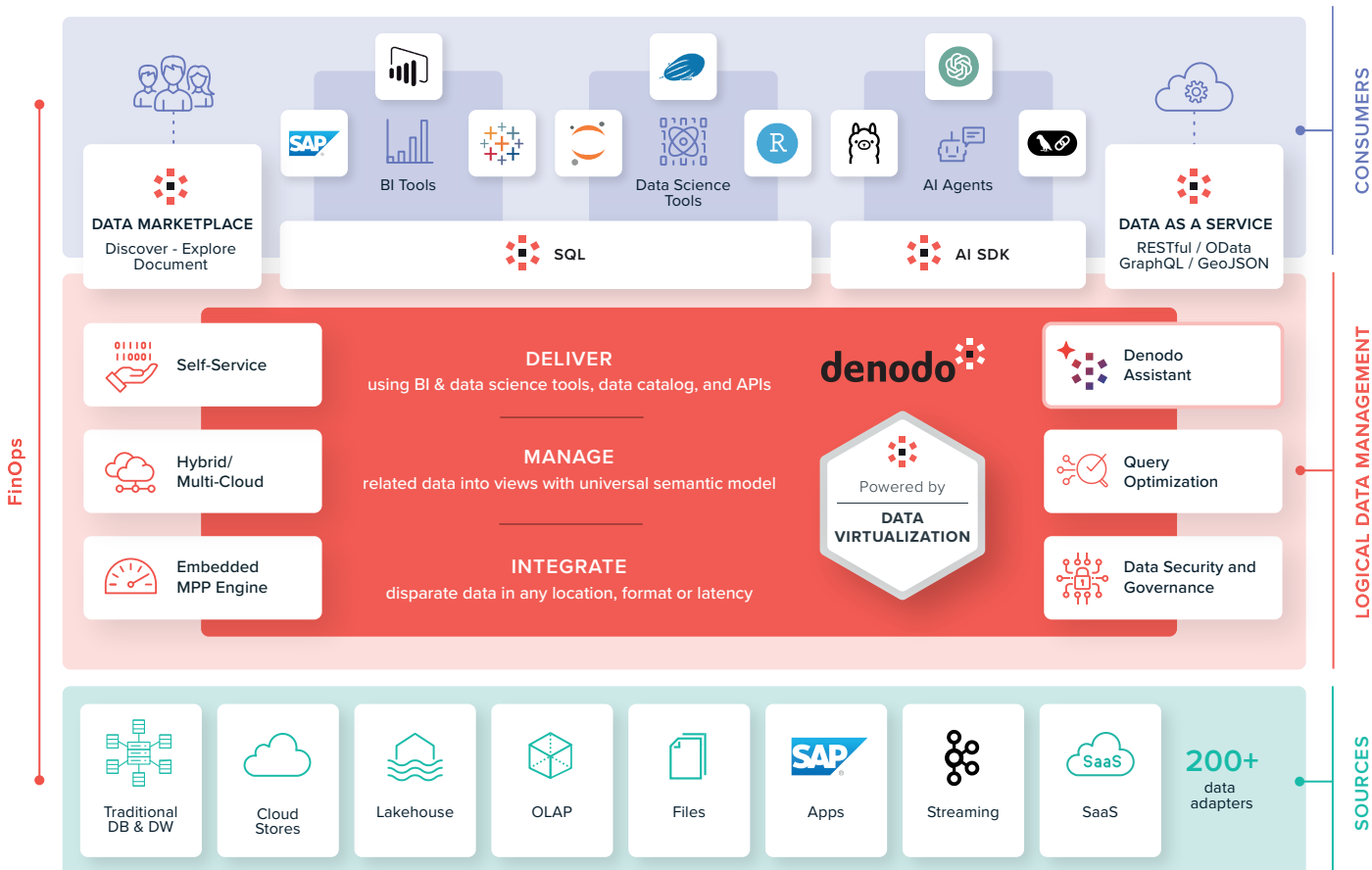


**Fig 1.** Denodo Platform architecture.

## Benefits:

By implementing data virtualization in multiple initiatives as part of the PRIDE project, Pantex saved $600,000 in only three months of production. With a one-time data virtualization investment of $520,000, Pantex achieved a 15% return on investment after only being in production for three months. The success of these projects resulted in continued funding from NNSA to Pantex as a part of the PRIDE initiative.

The data virtualization solution has also helped Pantex to reduce:

- Training, licensing, and maintenance costs
- Project cycle times, from the timely sharing of data
- Risk, through better security

**$600,000**
saved in 3 months

**15% ROI**
after 3 months in production



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