Data Virtualization and the API Ecosystem

Working Together, These Two Technologies Enable Digital Transformation

At the heart of any digital transformation, no matter the industry or the size of the company, there is an API strategy. Application programming interfaces (APIs) are the connection points between one application and another, and as such, they enable applications to build on each other, extend each other, and work with each other. Taken together, APIs represent a thriving ecosystem of developers that is showing no sign of slowing down.

Inside the API Ecosystem:

Companies that take part in this ecosystem, representing a quickly growing number of companies, form strategies around four key questions:

1. Which data across the organization do we want to expose as APIs?
2. How shall we build them?
3. Who will be able to access them?
4. How will users access these APIs?

By exposing data beyond enterprise borders to partner companies, organizations take part in a growing, interconnected web of applications, a teeming ecosystem of development.

API platforms assist with answering the fourth question above, as they act as gateways. API platforms enable companies to manage large numbers of APIs working in tandem, monitor their usage, and establish security between them. However, they are not optimized for data integration, so they cannot easily or quickly integrate large volumes of data between different systems.

Data virtualization is a technology that can greatly enhance the capabilities of an API platform, augmenting the benefits of an API-based architecture. Data virtualization enables real-time data integration without extensive coding and without needing to move or warehouse the new consolidated data. With data virtualization as part of their API strategy, companies can streamline digital transformations of any size and scope. In this brief, we explain the role of data virtualization in a company's API strategy, and end with two case studies of companies that have successfully leveraged data virtualization to facilitate strategic API implementations.
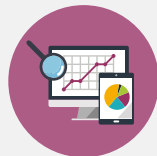
How Does Data Virtualization Work?

Rather than *moving* the data from different sources and combining the data in a new, consolidated location, data virtualization provides a view of the combined data, leaving the source data exactly where it is across the myriad source systems. This means that companies do not have to pay the costs of physically moving and housing the data, and yet they still gain all of the benefits of bringing the data together, including real-time access for all users, not just tech users, across the entire company.

Because data virtualization accommodates existing infrastructure in its existing state, it is relatively easy to implement, compared with other solutions. And because it provides a view of the data in real time, from a variety of systems that are normally very time consuming to integrate, such as transactional processing systems and cloud-based storage systems, it can support a wide variety of API use cases.

Data Virtualization Benefits

Real-time data access without replication

Consolidated views across myriad sources

A single point for implementing security and governance protocols

Detailed traces of data lineage

The ability to connect with most legacy and modern sources

Data Virtualization and APIs

Through data virtualization, companies can establish APIs that cover a wide range of functions:

Application integration: Data virtualization can create real-time views of data from multiple applications, and expose these views as APIs.

Business specific functions: Data virtualization can expose data as business views, tailored to the needs of business users.

B2B and local market functions: Data virtualization can expose data to business partners and other external companies, exposing only the data that is suitable for external exposure.

Below are three use cases illustrating how data virtualization can support a company's existing API ecosystem.

Data Virtualization as a Service Container

In this scenario, companies build services, host them within the data virtualization layer, and expose these services as APIs.

Companies may employ an API gateway, as shown above, which provides a front end to all services, whether they are coming from the data virtualization layer, a company's available "microservices" (discreet functions that can be readily reused independently of other related functions), or other enterprise applications.

Companies often use an architecture such as this for exposing most, if not all, of their companywide services.
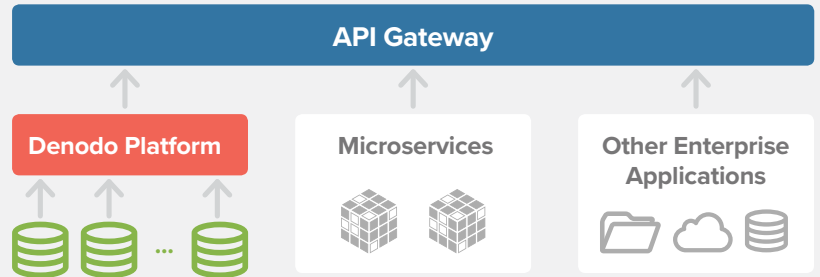

Data Virtualization as Source for Microservices

In this scenario, companies establish an abstraction layer using data virtualization, which draws data from myriad databases and provides it to each microservice when needed. The microservice gets the data from the data virtualization layer, and the data virtualization layer has the metadata necessary to access each source. This effectively hides the data access complexity from the microservice layer.
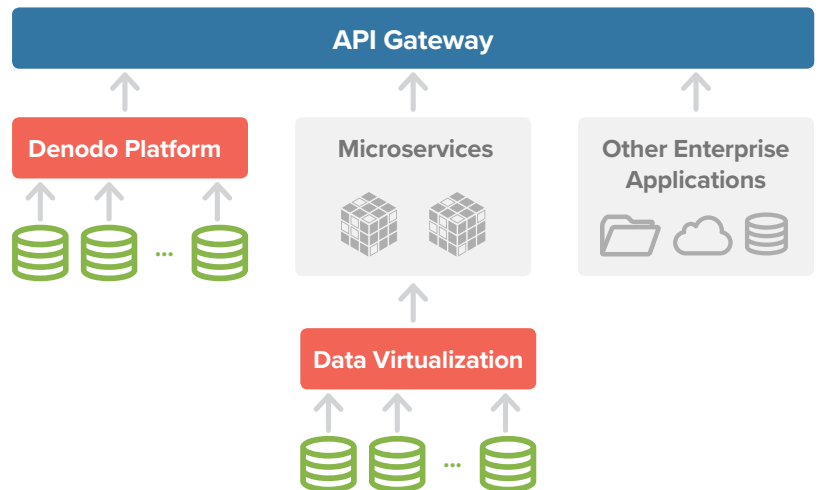
Data Virtualization as API Gateway

In this scenario, companies expose services, whether microservices or data services, to users outside the enterprise, through the data virtualization layer. When data virtualization layers are used in this way, they can provide authentication and other functionality in addition to acting as a gateway, such as enriching the microservices with real-time data from other enterprise sources.
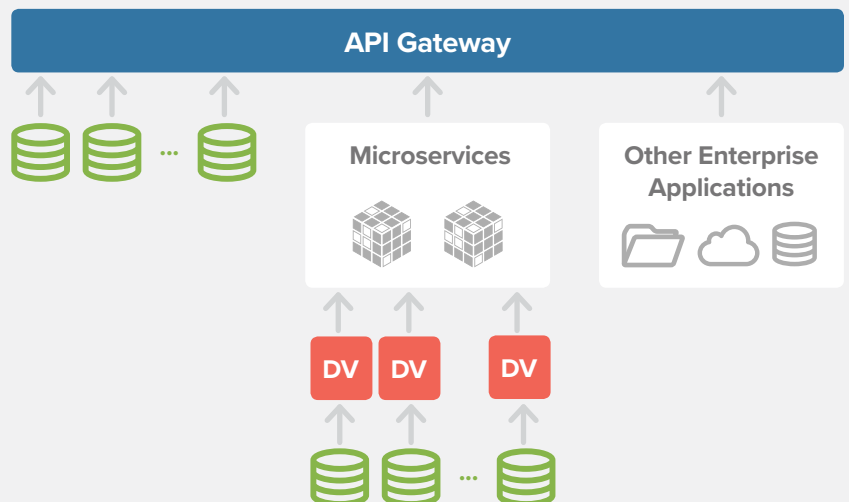
Case Studies

This section presents the case studies of two companies that have leveraged data virtualization to facilitate API-based initiatives.

GetSmarter: Using the Denodo Platform as an API Gateway

GetSmarter, based in Cape Town, South Africa and London, England, works with leading universities to offer premium online short courses to working professionals. The company prides itself on providing students with highly personalized customer service. As such, a monolithic CRM system formed the central heart of its infrastructure.

GetSmarter lacked common definitions for several entities, so the company opted to replace the CRM with a set of specialized microservices, such as one for enrollment and another for registration. However, this resulted in the need to connect to many different databases for reporting, rather than one, so GetSmarter was in need of a solution to streamline the architecture.

The Solution

GetSmarter leveraged the Denodo Platform, which uses data virtualization to unify access to the disparate sources. In addition, GetSmarter took advantage of the Denodo Platform's ability to implement global governance protocols across a single point of control.

Results

- The Denodo Platform enabled a real-time, universal access point across all reporting databases.

- With the Denodo Platform in place, GetSmarter can ensure that the right student always gets connected to the right success manager, and gets connected as quickly as possible.

- With innate support for implementing global governance controls, the Denodo Platform facilitated GetSmarter's compliance with South Africa's PoPI regulations governing the use of personal information.

- Because GetSmarter performed a phased migration to the new infrastructure, the Denodo Platform enabled the company to maintain operations during the transition.
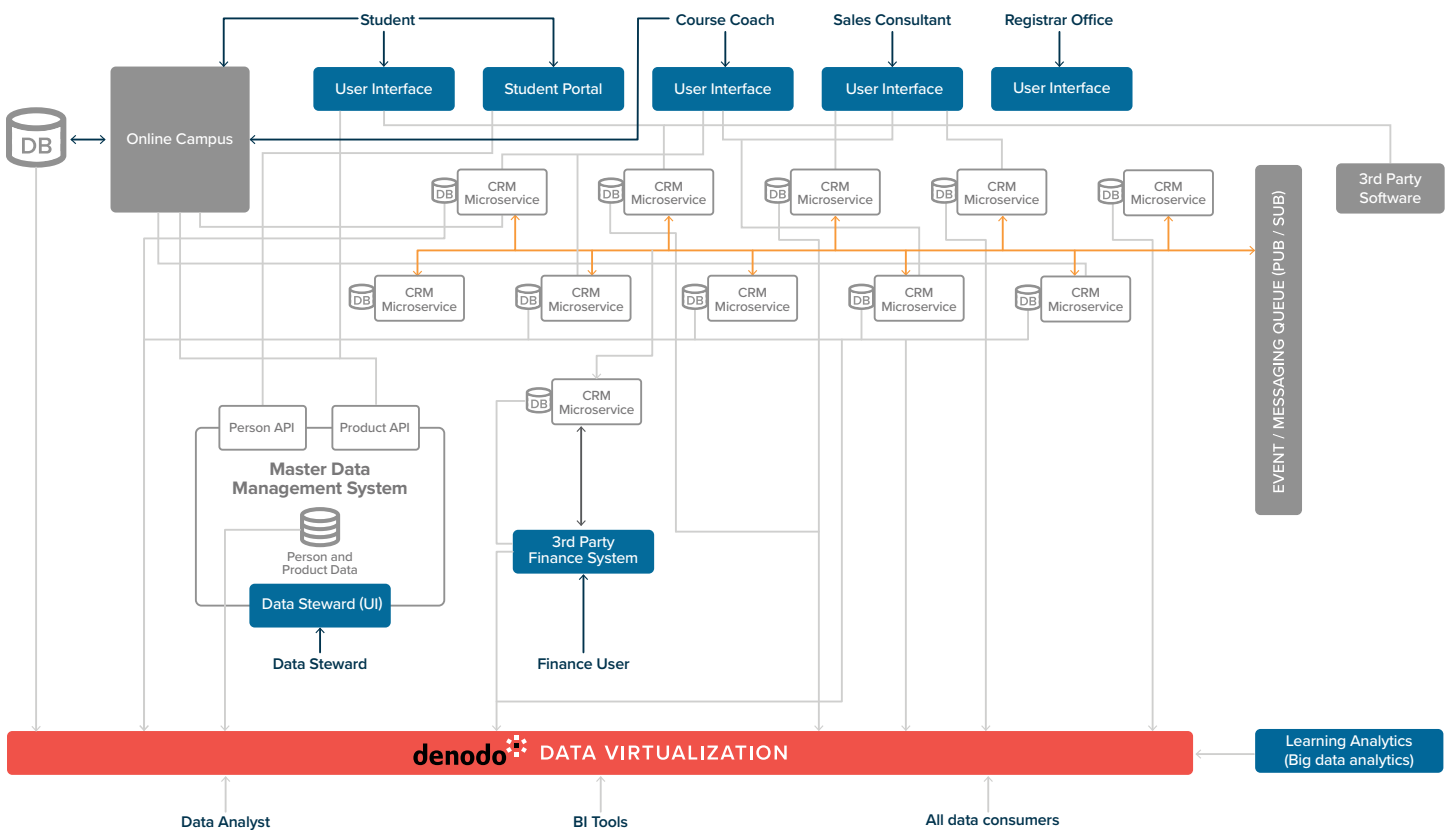
Eli Lilly: Using the Denodo Platform as Service Container

Eli Lilly and Company is an American global pharmaceutical company with headquarters in Indianapolis, Indiana, in the United States, and offices in Puerto Rico and 17 other countries. Like many pharmaceutical companies, Eli Lilly needed to reduce the time and cost of its drug discovery and development processes. For Eli Lilly, one culprit was the requests management process, which was cumbersome because it relied on disparate siloed internal systems and vendor portals.
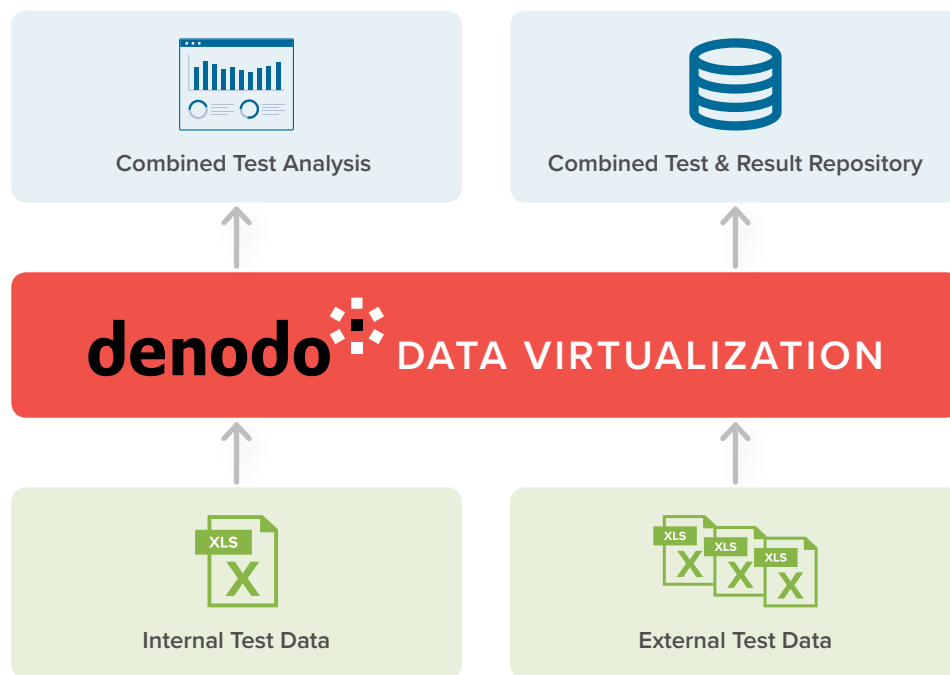
The Solution

Eli Lilly implemented the Denodo Platform, which uses data virtualization to serve as a container for APIs relating to a new set of services in support of requests. Forms that were part of the original requests process were mapped to the new, underlying web services using the Denodo Platform's abstraction layer and exposed as RESTful Data Services for the scientists to access.

Results

By implementing the Denodo Platform, Eli Lilly gained:

- **Faster time-to-market**. Scientists can more effectively focus the core process of researching and developing new drugs.

- **Superior insight**. Better analytics for the drug discovery process, through the new unified view of data.

- **Stronger enterprise security**. The Denodo Platform made it easy for business teams to comply with enterprise and security policies without IT involvement.

- **Enhanced drug safety**. The new infrastructure offers enhanced security and safety for drug discovery information within and across the enterprise boundary.