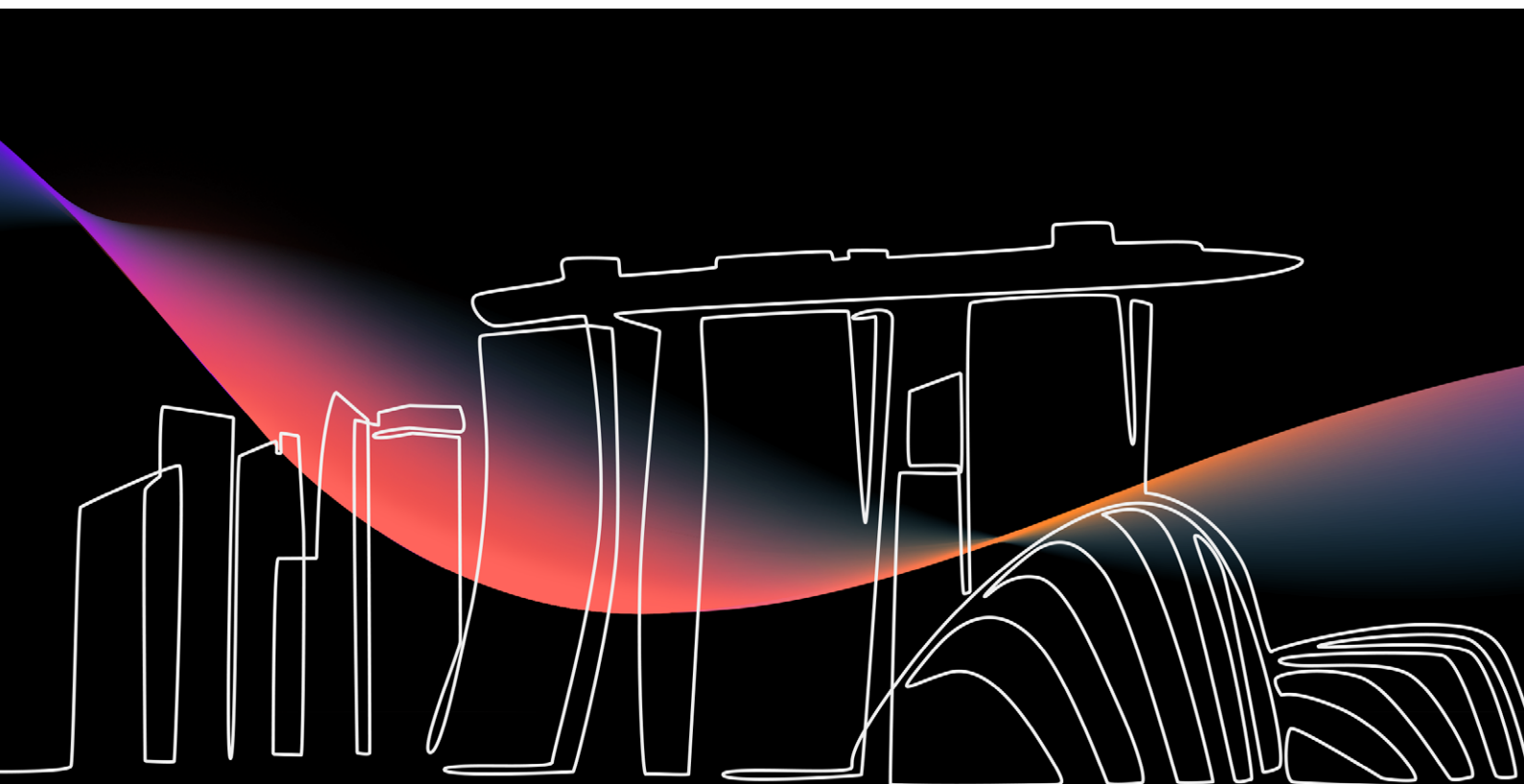
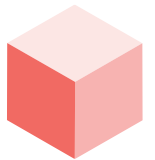


Building a Smart Nation with a Data Fabric for Generative AI



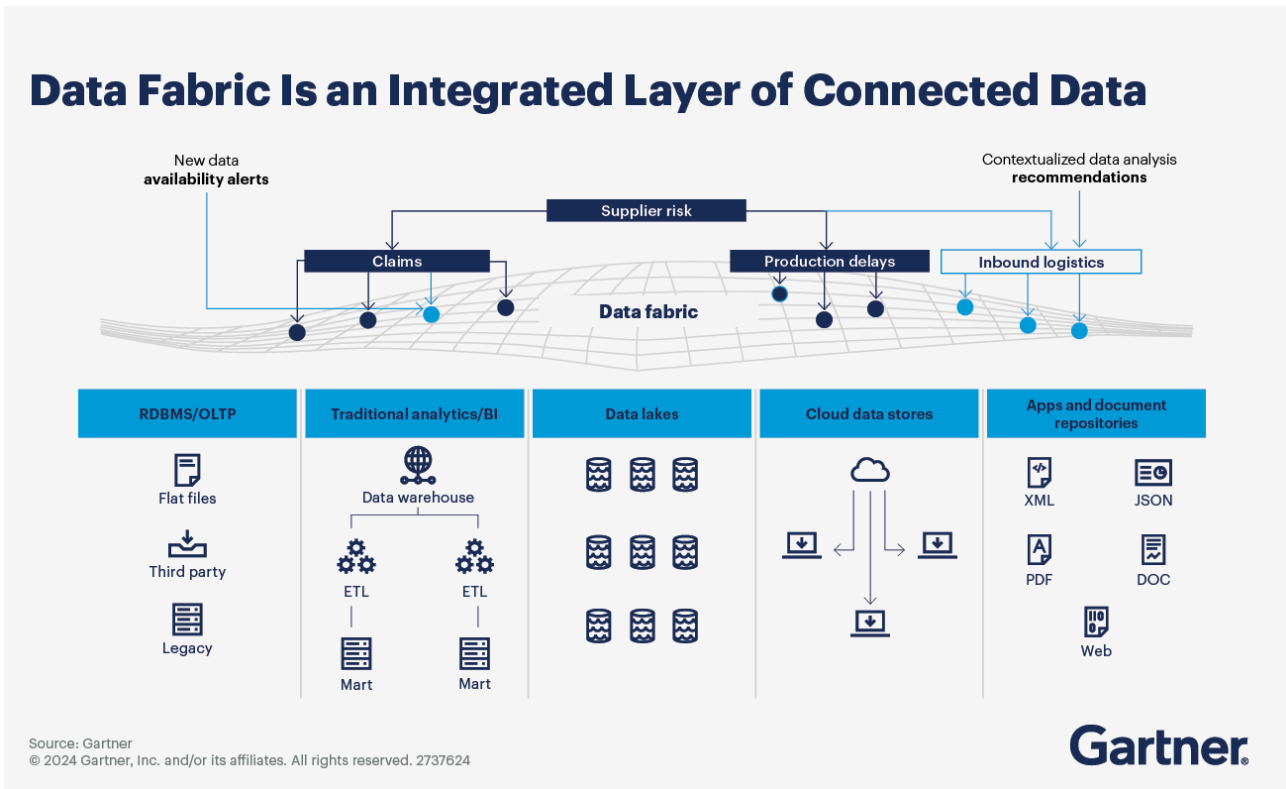
Singapore’s **National AI Strategy 2.0** sets out a strong vision for AI to serve the public good, both locally and globally. As the nation progresses toward its Smart Nation 2.0 objectives, emphasis is placed on trusted digital infrastructure that can support transformative technologies like generative AI (GenAI). A foundational component of this transformation is enabling seamless, secure, access to high-quality data across domains. A data fabric, built on data virtualization and a logical approach to data management, can play a key role in enabling AI systems to deliver accurate, timely, and responsible insights across public sector services.

As digital initiatives in Singapore mature, the need to democratize access to trusted data, while safeguarding privacy and governance, grows increasingly critical. With initiatives spanning healthcare, education, tax administration, and citizen engagement, AI systems require a real-time understanding of structured and unstructured data in a governed environment. A data fabric offers this foundation.

The Role of a Data Fabric

A data fabric offers an intelligent approach to not only accessing and managing data distributed across multiple platforms and systems, but also enabling interconnections to facilitate powerful use cases.

This architecture supports AI implementations by creating a common, secure data access layer. Applications and analytical tools—including GenAI models—can leverage it to work with live data across systems without relying on complex extract, transform, and load (ETL) processes or duplicated repositories. This not only enhances data freshness and accuracy, but also preserves data sovereignty and compliance with policies such as Singapore’s **Personal Data Protection Act (PDPA)**.



With built-in semantic modeling and standardized access interfaces (e.g., SQL, REST, OData, GraphQL), public sector teams would be able to accelerate the development of AI applications while maintaining full oversight of data flow and usage.

The Denodo Approach to a Data Fabric

Denodo leverages a logical approach to managing data, supported by data virtualization, to enable real-time access to disparate data, without requiring replication. In this way, the Denodo Platform enables a powerful data fabric that enhances AI readiness for public sector innovation. Its core capabilities include unified, real-time data access, semantic modeling, governance enforcement, and intelligent data delivery. A Denodo-enabled data fabric supports full data traceability and lifecycle management, training and evaluating AI models with up-to-date, explainable data sources.

Denodo provides a secure, federated view of distributed data sources, including on-premises systems, cloud repositories, and legacy applications. Its semantic layer abstracts technical complexity and presents data in a business-friendly format, making it easier for developers, analysts, and AI systems to interpret diverse datasets.

Through a Denodo-enabled data fabric, agencies can create curated, governed data products—predefined logical views that support key policy domains or citizen service areas. These products simplify access for AI developers, reduce duplication of effort, and improve data consistency across multi-agency workflows.

The Denodo **AI SDK** offers the technical integration needed to connect GenAI models, chatbots, or agentic systems to enterprise data—supporting natural language interfaces, metadata-driven discovery, and advanced querying patterns.

Enabling GenAI in the Public Sector

Denodo enables GenAI applications to operate with high precision, security, and scalability. By serving as a dynamic data layer between large language models (LLMs) and enterprise data, Denodo enables AI systems to retrieve governed information through real-time APIs or retrieval-augmented generation (RAG) workflows.

To meet the growing demand for deeper insights, Denodo introduced Denodo **DeepQuery**, which elevates GenAI beyond basic search. DeepQuery enables LLMs to execute multi-step reasoning across virtualized views, combine multiple data sources into a coherent response, and cite sources to improve explainability.

Combined with metadata-rich context from Denodo’s semantic layer, DeepQuery enables AI systems to generate insights—not just answers. For example, a policy analyst could ask an AI assistant to analyze trends in housing assistance applications, and DeepQuery would synthesize the data, join the relevant sources, and provide reasoned output that meets compliance requirements.

Denodo also supports **agentic AI architectures**, in which multiple LLMs collaborate in orchestration. Through capabilities like prompt customization, automated join suggestions, and Model Context Protocol (MCP) compatibility, Denodo enables intelligent planning, retrieval, and interpretation. These capabilities are becoming increasingly common in applications like automated benefits processing, education support systems, and internal knowledge assistants.



Use Cases across Singapore's Public Sector

Singapore's public sector is deploying AI across diverse domains, as outlined in the Singapore **AI Playbook**. A data fabric and GenAI, working in tandem, have the potential to offer powerful new capabilities that can expand this momentum:



In citizen services, chatbots powered by a Denodo-secured RAG framework can provide timely, accurate responses using governed source data.



For healthcare intelligence, GenAI models can surface public health insights from federated systems, while masking sensitive patient data in compliance with PDPA. For example, DeepQuery could analyze trends in **HealthHub** data to identify factors affecting vaccination rates, delivering explainable insights with citations.



In education, multi-agent systems could support students or teachers by providing curriculum-aligned responses, backed by live content and policy data.



Policy analysts could benefit from DeepQuery's ability to explore real-time trends, such as housing assistance application patterns, synthesizing data from multiple agencies to explain delays and propose solutions.



Finance and compliance teams can benefit from AI copilots that query operational metrics, detect anomalies, and generate reports based on reusable data products.



In cybersecurity, agentic systems for vulnerability probing could leverage Denodo's governed data access as a potential application, with DeepQuery providing explainable analyses of security trends.

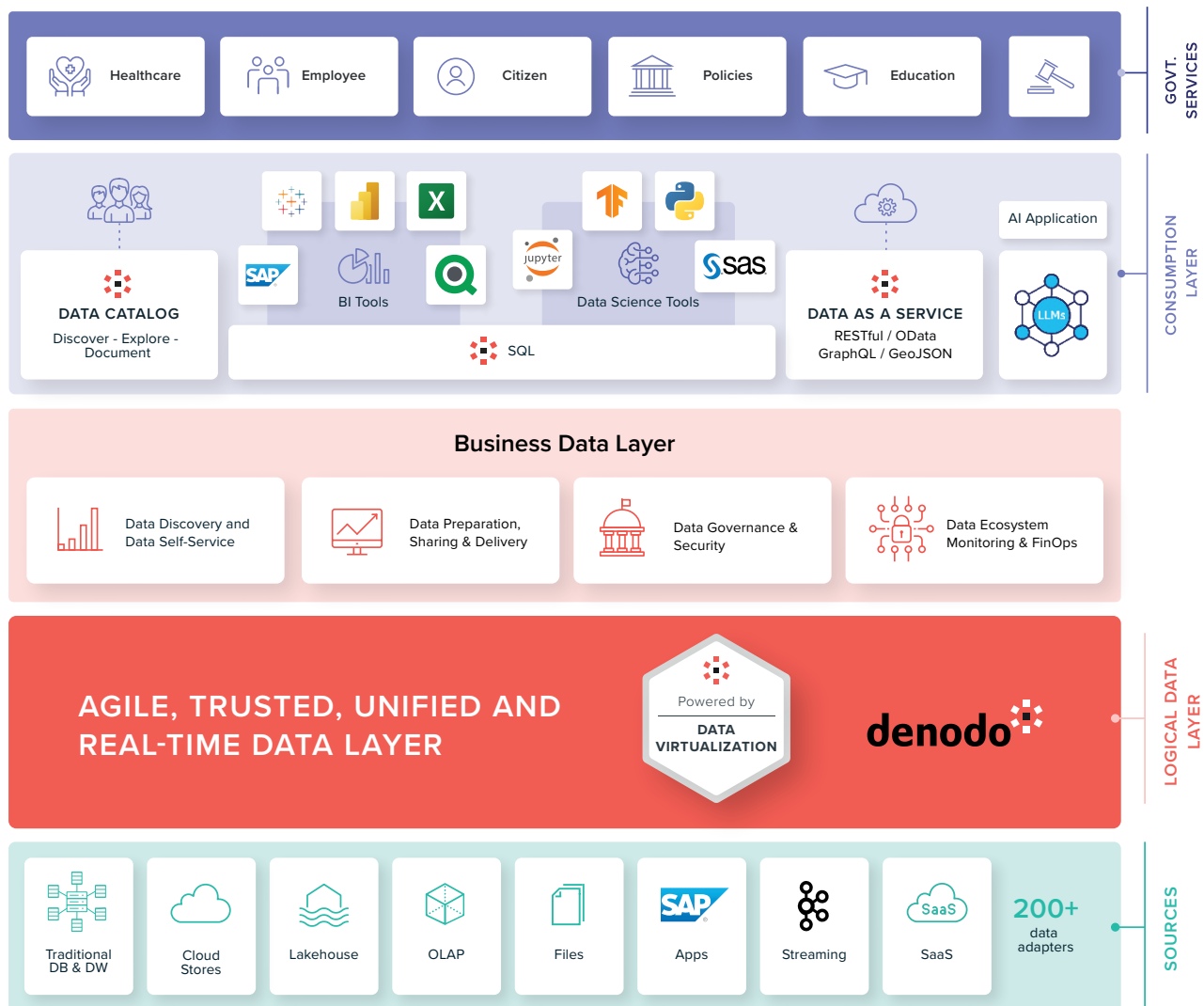
Such applications reflect the types of services envisioned in Singapore's **Public Sector AI Playbook**, services for which AI supports efficient, citizen-centric delivery of services, while upholding data protection and governance mandates.

Conceptual Architecture: Denodo + GenAI in Government

In a typical deployment, Denodo connects to distributed government data systems—including databases, warehouses, APIs, and unstructured sources. It aggregates these sources into secure, virtualized views enriched with semantic metadata. AI models and assistants connect to this layer through standard protocols (e.g. REST, JDBC, GraphQL) or vector-based embedding tools.

When a GenAI assistant initiates a query, the Denodo AI SDK supports context-aware data retrieval in line with role-based permissions and real-time relevance. The system enables all data accessed by the AI to be governed, timely, and traceable.





How data fabric can support public sector AI-based services

A Strategic Fit for Singapore's Smart Nation Vision

As outlined in the **National AI Strategy 2.0**, Singapore is investing in trusted data platforms, cross-agency collaboration, and responsible AI innovation. A Denodo-enabled data fabric provides a practical foundation for each of these pillars:

- **Trust:** Policies like PDPA and AI governance frameworks require explainable, compliant access to data. Denodo applies governance at every touchpoint.
- **Openness:** Denodo's abstraction layer supports interoperability and standardized data sharing, aligning with open data efforts.
- **Innovation:** GenAI pilots and sandboxes can benefit from virtual data environments that are safe, reproducible, and agile.
- **Scalability:** Logical data products enable the rapid scaling of AI use cases without restructuring physical data infrastructure.

These principles can enable Singapore to expand its AI footprint with confidence, so each AI-driven application is built on secure, real-time, and mission-aligned data.

Conclusion

As Singapore continues to lead in public sector AI adoption, a trusted data foundation is critical for sustaining effectiveness, security, and innovation. Denodo enables the data fabric needed to operationalize AI-ready data across government systems.

With real-time, governed access to distributed information, agencies can deploy GenAI solutions that are scalable, transparent, and aligned with national goals. The Denodo Platform can form the foundation for Singapore's long-term vision of responsive, data-driven public service delivery.

References:

- [How to Accelerate AI with a Logical Data Fabric \(Denodo\)](#)
- [Public Sector AI Playbook \(GovTech\)](#)
- [Agentic AI Primer \(AIP.gov.sg\)](#)
- [Denodo AI SDK](#)
- [PDPA Compliance Guidelines \(PDPC\)](#)

For Further Reading:

- [Smarter AI Starts Here: Why DeepQuery is the Next Step in GenAI Maturity](#)
- [From Chatbots to Agents: Navigating the Future of AI](#)

Contact Denodo today **to start your AI transformation journey!**



Denodo is one of the products awarded in the GovTech's bulk tender (Reference No. GVT(T) 20005) for the provision of Data Science (DS) Software and Services to Government Ministries/Departments, Statutory Boards, Organs of State and Participating Entities.



Denodo is a leader in data management. The award-winning Denodo Platform is the leading logical data management platform for transforming data into trustworthy insights and outcomes for all data-related initiatives across the enterprise, including AI and self-service. Denodo's customers in all industries all over the world have delivered trusted AI-ready and business-ready data in a third of the time and with 10x better performance than with lakehouses and other mainstream data platforms alone.

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