

Trusted, AI-Ready Data for Government in ASEAN

Bridging the Gap Between
AI Ambition and Public Sector Reality



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Introduction: ASEAN's Inflection Point for AI in Government

Artificial intelligence is rapidly emerging as a defining force in ASEAN's digital transformation. Governments across the region are exploring how AI can enhance public service delivery, strengthen decision-making, and improve economic resilience. AI is projected to contribute between 10% and 18% of ASEAN's GDP by 2030,¹ highlighting its strategic importance.

However, this opportunity is unfolding unevenly. ASEAN's public sector landscape remains fragmented across infrastructure, regulatory maturity, and institutional readiness.^{1,2} While leading nations are advancing AI strategies and governance frameworks, others are still building foundational capabilities.

This divergence is increasingly reflected in a growing "data divide" across the region, where differences in data accessibility, integration, and governance limit the ability of governments to scale AI consistently.^{1,2} In more mature environments, data is becoming a strategic asset for real-time decision-making, while in others, fragmentation continues to constrain visibility, coordination, and trust.

Hence, there is a critical gap between **AI ambition and operational reality** that must be addressed for governments to scale AI safely and effectively.

However, any transformation requires the participation of all stakeholders in the organization; it's not just one team's job. All need to participate, and all need to have confidence that the AI is trustworthy. Data teams need to be empowered to deliver trusted, AI-ready data products. AI teams need to deliver agents, confident that they are able to access and utilize the right data at the right time, safely. Finally, public policy and operational stakeholders must have confidence that the AI is making trustworthy decisions and actions based on trusted data. Denodo provides an intelligent foundation for trust that empowers all three stakeholders to work together for maximum benefit.

The Reality Gap: Adoption Is Rising but Not Scaling

Despite strong policy momentum, AI adoption across ASEAN governments remains limited.

Only a small number of countries reported operational AI use in the public sector, among the eight surveyed Southeast Asian countries, while others remain at early or exploratory stages.² At the same time, several ASEAN countries lack instruments to support the responsible use of AI in the public sector, which means that governance frameworks for maintaining responsible AI remain underdeveloped across much of the region.

This is reinforced by broader regional observations. ASEAN-wide assessments highlight fragmentation in regulatory approaches and uneven readiness across countries, while UNDP notes that even fast-moving markets such as Vietnam must address data fragmentation, policy alignment, and data governance challenges, to scale AI effectively.³

The result is a structural bottleneck: governments are investing in AI but may lack the data foundations and governance models required to operationalize it.

The Trust Gap: Data as the Limiting Factor

At the core of this challenge is trust.

Public sector AI must meet a higher bar than enterprise AI. Decisions must be explainable, auditable, and aligned with policy frameworks. When outputs cannot be trusted, adoption stalls.

This trust gap is driven by systemic data issues. These issues reflect a broader data divide across agencies and jurisdictions, where inconsistencies in data access, quality, and governance prevent AI systems from operating with the reliability required in public sector environments:^{1,2}

- **Data is fragmented across agencies**, limiting unified insights.
- **Data cannot be accessed in real time**, reducing the data's relevance for decision-making.
- **Data lacks semantic context**, leading to misinterpretation.
- **Data governance is inconsistently applied**, increasing risk.

AI systems fail not because of model limitations, but because they operate on incomplete, stale, or ungoverned data. In such conditions, AI systems are more likely to generate inaccurate or unverifiable outputs, increasing the risk of hallucinations and undermining trust in decision-making. According to analysts, 60% of AI projects not supported by an AI-ready data practice are expected to fail to deliver on SLAs and be abandoned.⁷

From Generative to Agentic AI: Raising the Stakes

AI in government is evolving rapidly, from generating insights to executing decisions.

Agentic AI systems can evaluate conditions, trigger workflows, and act autonomously across systems. This is particularly relevant in public sector scenarios such as:

- Fraud detection and prevention
- Compliance monitoring
- Emergency response coordination
- Citizen service automation

However, this shift significantly raises the stakes. Once AI systems act autonomously, organizations remain fully accountable for the outcomes.⁸ Agentic AI does not remove ownership — it makes ownership more visible. This means every AI-driven action must be:

- Traceable to data
- Aligned with policy
- Explainable and auditable

This is only possible when AI systems are built on a trusted data foundation.

The Intelligent Foundation for Trust: Empowering Key Stakeholders

To turn AI ambition into demonstrable value, the public sector must align three critical stakeholder groups across the organization. The transformation cannot be owned by a single team. It requires coordinated execution across policy and operational stakeholders, AI teams, and data teams, all operating on a shared foundation of trusted data.

- 1. Policy and operational stakeholders** require intuitive, self-service access to data and insights, enabling them to explore information, ask questions in natural language, and make decisions with confidence. Their trust depends on receiving accurate, explainable outputs grounded in governed data.
- 2. AI Developers** need the ability to easily build, deploy, and orchestrate intelligent agents that can operate across systems. This requires seamless, real-time access to trusted data, along with assurance that all data usage is secure, compliant, and aligned with policy.
- 3. Data Engineers and Architects** are responsible for provisioning, governing, and delivering high-quality, reusable data products. They must enable consistency, semantic clarity, and policy enforcement across distributed systems, so AI and business teams can operate with confidence.

Only when these three groups are aligned on a shared data foundation can governments move from isolated AI experiments to scalable, production-ready systems.

Rethinking the Data Foundation: From Individual Pipelines to an Active Context Layer

Traditional architectures, often built on data movement and replication, cannot support the dynamic needs of AI.

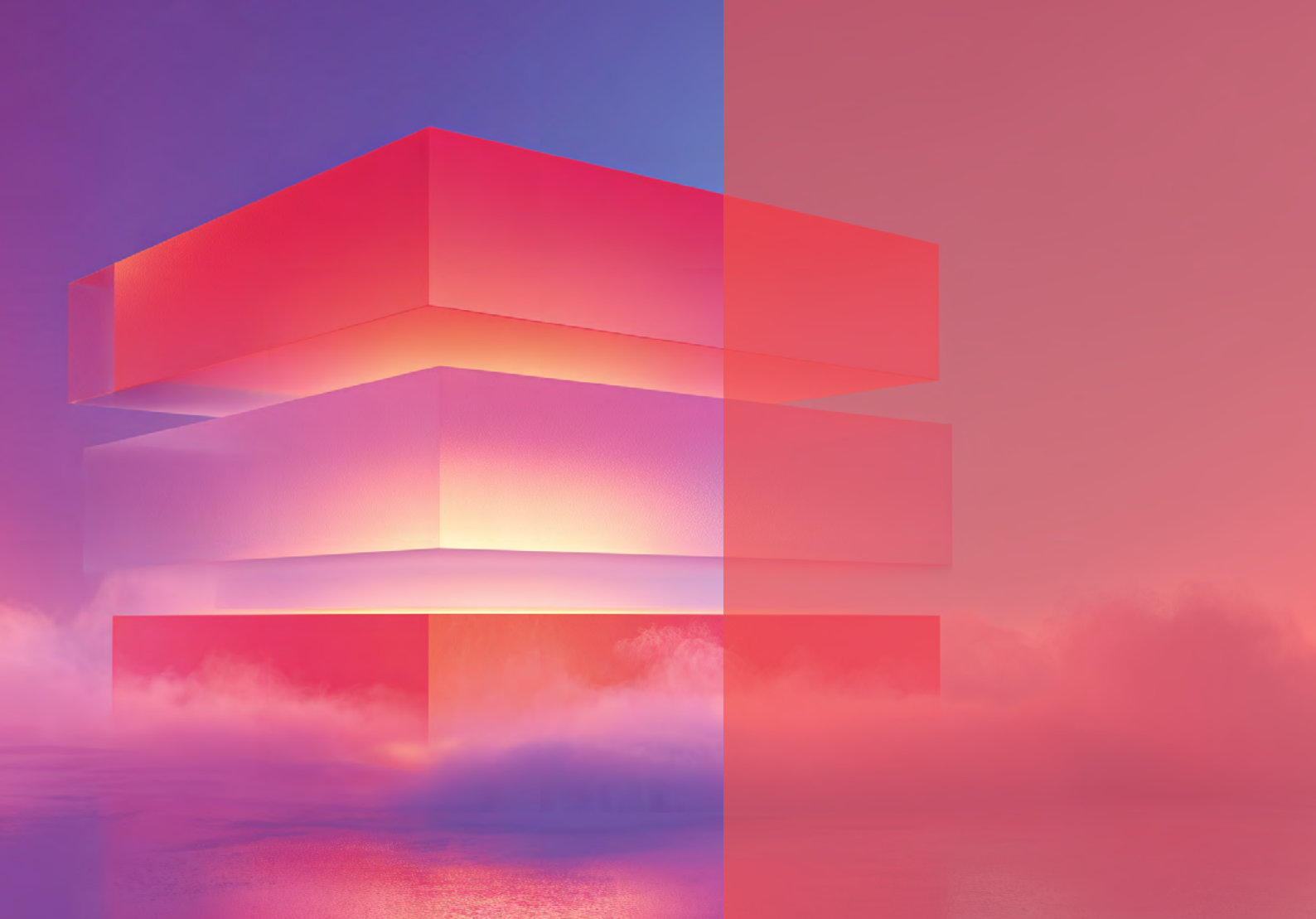
AI systems require real-time access across domains, context-aware data interpretation, and dynamic, on-demand data retrieval. Vendors that lock data into proprietary platforms through forced migration create data gravity: a form of dependency that constrains agility and undermines data sovereignty. This is particularly consequential for ASEAN governments, where national data sovereignty requirements are a policy priority.

To meet these requirements, governments can implement **an active context layer**, which provides AI with the context it needs to be trustworthy.

To be effective, an active context layer should be supported by such features as universal connectivity, zero copy delivery, governed access, and semantic unification, all across disparate data sources. These stringent requirements can be met with a logical data management approach, which enables access to live data across disparate data sources, without requiring the data to first be centralized in a common repository. This approach establishes an enterprise-wide abstraction layer between data consumers and data sources, simultaneously providing necessary semantics and business context to deliver the right data, while also enabling the direct access and delivery of live data for good decisions and actions, all without having to copy data. This **data anti-gravity** approach enables:

- **Unified access** without data movement or replication
- **Centralized governance and unified semantics** across distributed systems
- **Real-time, contextualized** data delivery
- **Reduced migration overhead** by enabling AI systems to access data in place, enabling governments to leverage existing investments without additional large-scale data movement.

This approach closely aligns with government priorities around interoperability, sovereignty, and cross-agency collaboration.



The Denodo Platform: AI-Ready

The Denodo Platform enables this critical active context layer for AI — a governed, unified, real-time layer that sits between an organization's distributed data systems and the AI and analytics systems that consume them. It semantically unifies all data, bridging fragmented data environments and AI systems, and delivers trusted, real-time, governed data across the public sector.

The Denodo Platform stores no data, only the metadata necessary to access the underlying data sources, as well as the active metadata to monitor operational usage and data lineage, for data governance at the point of access. Denodo not only enables unified access, but also provides advanced capabilities for query optimization, workload management, and intelligent caching, enabling AI applications in government environments to scale reliably while maintaining performance and cost efficiency across distributed data sources. It also provides support for API-based data services and integration patterns, enabling seamless connectivity between data platforms, digital services, and AI systems, without requiring architectural disruption.

Advanced Capabilities for Agentic AI Environments

Denodo introduces capabilities that accelerate the transition from experimentation to operational AI, particularly in agentic AI environments.

A key advancement is improved support for **unstructured data integration**. This is particularly relevant for public sector use cases such as policy analysis, legal interpretation, regulatory compliance, and citizen service interactions, where critical information often resides in documents, reports, emails, audit records, policy documents, legal frameworks, and citizen case files.

By enabling unified access to both structured and unstructured data within the same governed framework, Denodo enables AI systems to generate responses that are not only contextually richer, but also aligned with official documentation and policy sources. This means that with Denodo, AI-driven outputs in government contexts are grounded in authoritative sources, improving explainability, compliance, and audit readiness.

In addition, enhancements supporting agent orchestration, workload optimization, and real-time data delivery enable AI systems to operate reliably in mission-critical environments, where multiple agents may need to coordinate across systems, dynamically enforce policies, and respond to events with minimal latency.

Denodo: Advantages for Public Sector AI

To operationalize AI at scale, Denodo provides several features that directly address the challenges of trust, context, and action. These capabilities are designed to directly address public sector requirements for explainability, governance, and real-time decision-making, rather than functioning as standalone technical features.



DENODO DEEPCQUERY

Denodo DeepQuery enables AI systems and users to go beyond simple data retrieval by supporting multi-step reasoning across distributed data sources. It enables complex, analytical questions, such as why a metric is changing and what factors are driving it, to be broken down, analyzed, and answered using governed, real-time data with full traceability.

For policy and operational stakeholders, it lets users explore data using natural language and perform complex, multi-step analysis without relying on technical teams. Grounded in governed KPI and metric definitions, it enables decision-makers to conduct deep investigations and obtain consistent, explainable insights based on trusted business logic.

For AI developers, it provides a mechanism for embedding structured reasoning into AI workflows, enabling agents to access multiple data sources, perform intermediate analysis, and generate traceable, auditable outputs that rely on governed metric views rather than metric logic inferred from raw fields.

For data engineers and architects, it leverages the semantic layer and governance framework, including metric views, so all queries are executed against trusted, curated data products with consistent business definitions, maintaining accuracy and compliance across systems.



THE DENODO AI SDK

The Denodo AI SDK enables the development and orchestration of agentic AI systems that can evaluate conditions, trigger workflows, and interact with enterprise systems in real time. It abstracts the complexity of accessing and governing distributed data environments, and is now reinforced by the connected context of the Denodo Data Marketplace 360 Graph, which shows how data products relate to the surrounding processes, consumers, definitions, and governance controls.

For policy and operational stakeholders, it provides confidence that AI-driven decisions and actions are based on trusted, real-time data, with full visibility into lineage, ownership, and governance context, aligned with regulatory and organizational requirements.

For AI developers, it enables rapid development and deployment of intelligent agents that can draw on richer context from a connected knowledge graph of enterprise assets, including applications, notebooks, pipelines, glossaries, governance controls, and AI skills, so developers can focus on business logic while keeping all data real-time, governed, and policy-compliant.

For data engineers and architects, it enables all data accessed by AI agents to be secure, governed, and aligned with enterprise policies, while strengthening impact analysis and governance visibility, without requiring data movement or duplication.



DENODO ASSISTANT

Denodo Assistant uses natural language and automation to generate semantic metadata, enrich data context, and now assist in creating and managing data views through an AI-assisted conversational experience, making data easier to build, understand, and use across both human and AI-driven workflows. It accelerates the creation of AI-ready data products.

For policy and operational stakeholders, it enables intuitive interaction with data through natural language, so non-technical users can discover and understand data without requiring technical expertise.

For data engineers and architects, it accelerates semantic modeling, metadata generation, and data view development across the Denodo development experience, including Design Studio, by asking clarifying questions and supporting multi-step refinement to move from business intent to governed data views faster, reducing manual effort and rework.

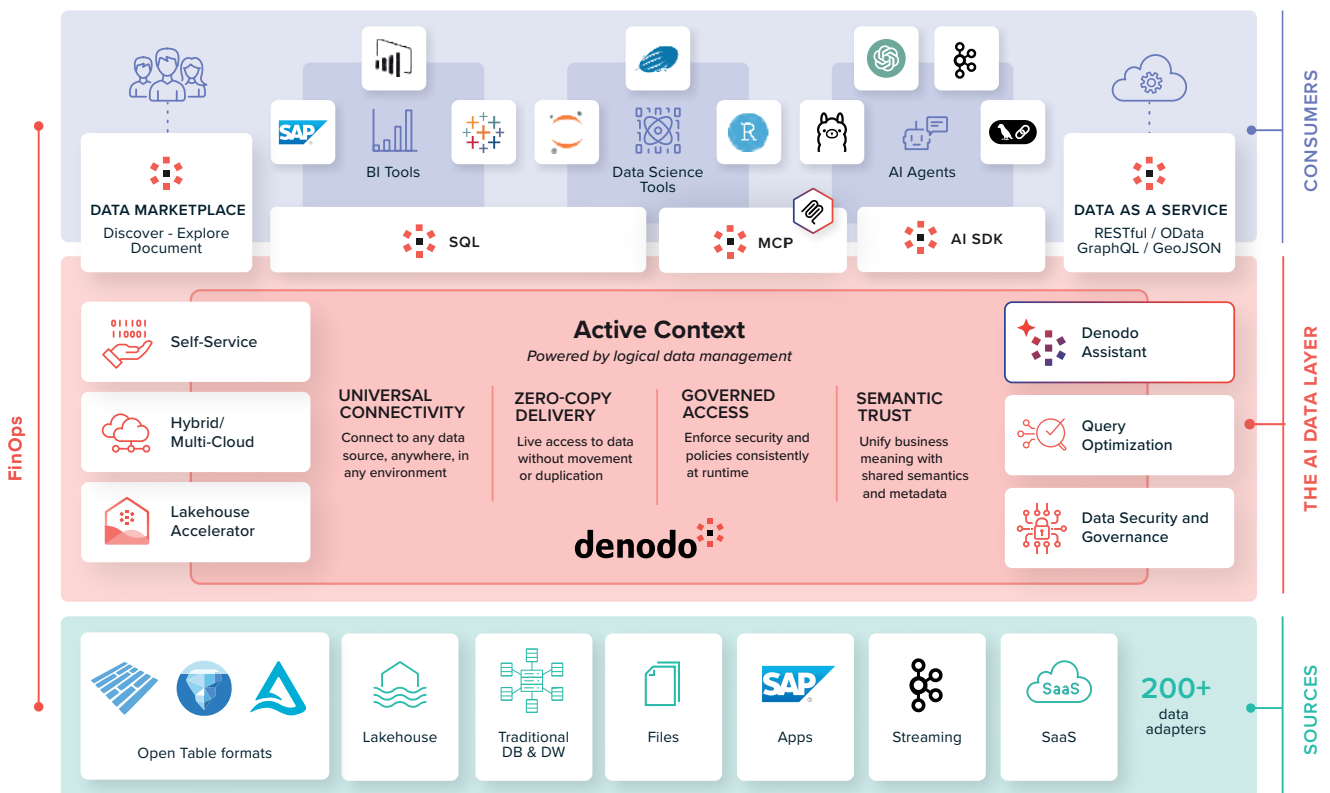
For AI developers, it enables AI systems to operate with the correct context and meaning, reducing hallucinations and improving the accuracy and reliability of outputs.

Reference Architecture: AI on a Semantically Unified Data Foundation

The architecture below introduces active context, which is enabled in large part by a universal semantic layer, also known as a business semantic layer, between distributed systems and AI applications.

Data remains within source systems, preserving sovereignty and compliance. The semantic layer seamlessly standardizes the semantics across all data sources, while AI systems interact with this layer to retrieve and act on trusted data.

The architecture also supports flexible data access patterns, including APIs and data services, enabling integration with existing government platforms, digital services, and AI frameworks without requiring architectural changes.





Public Sector AI Use Cases in ASEAN: From Strategy to Execution

Across ASEAN, governments are progressing at different levels of maturity in their AI journeys, but clear national priorities are emerging. While strategies vary by country, a consistent regional pattern is taking shape, focused on improving citizen services, strengthening regulatory oversight, enabling smart infrastructure, and accelerating whole-of-government digital transformation.^{1,2}

Singapore leads the region with its National AI Strategy 2.0 (NAIS 2.0), supported by strong investment and governance frameworks,^{5,6} demonstrating the most advanced deployment of AI across public sector operations, service delivery, and policymaking.² GovTech Singapore plays a central role in enabling these capabilities through whole-of-government digital platforms and AI-enabled services.⁴ Indonesia and Thailand are advancing national strategies with increasing emphasis on governance, ethics, and sectoral adoption, particularly in areas such as financial oversight, agriculture, and smart cities.^{1,2} Malaysia is strengthening its national AI ecosystem through policy, infrastructure, and regional leadership initiatives, while Vietnam and the Philippines are accelerating adoption through digital public services, AI-enabled platforms, and increasingly active regulatory frameworks.

Taken together, these national strategies point to a clear regional convergence. Across ASEAN, governments are prioritizing AI in areas such as fraud prevention, regulatory compliance, citizen service delivery, and cross-agency coordination.^{1,2} While the level of maturity differs, the underlying requirements remain consistent: the ability to access distributed data in real time, integrate structured and unstructured information, and enable every AI-driven decision to be transparent, governed, and aligned with policy frameworks.

Crucially, delivering on these priorities requires more than deploying AI solutions in isolation. It requires coordinated execution across policy and operational stakeholders, AI teams, and data teams. Those involved in policy must trust the decisions generated. AI teams build the systems that operationalize those decisions. Data teams keep all inputs accurate, governed, and contextually aligned. These use cases illustrate how this alignment plays out in practice across ASEAN governments.

These priorities are already translating into concrete operational use cases across the public sector, typically delivered through reusable data products such as those focused on Citizen 360 views or compliance intelligence. These data products provide curated, governed datasets that can be consistently reused across agencies, enabling both scalability and standardization in AI-driven initiatives.



IN FRAUD DETECTION

Governments are increasingly combining tax, procurement, and identity data across agencies to identify anomalies in near real time. This is particularly relevant in markets such as Indonesia and Thailand, where strengthening financial oversight and reducing financial leakages are key priorities. Thailand enacted AI-powered scam-blocking legislation in April 2025, and Indonesia's financial sector has accelerated AI-driven fraud detection as digital payment volumes grow.

From a regulatory perspective, investigators and financial controllers must be able to quickly validate alerts and understand why a transaction has been flagged. Without explainability, trust in AI-driven fraud detection remains limited.

Denodo can enable this by providing real-time integration across distributed systems, while advanced query optimization and caching enable high-performance access even across large datasets. The Denodo Platform's data lineage and governance capabilities enable AI-generated fraud signals to be traceable back to specific transactions and source systems, improving both accuracy and auditability.

For AI teams, this enables the development of systems that can dynamically correlate signals across multiple datasets while maintaining full traceability. For data teams, it enables cross-agency data to be consistently governed, accessible in real time, and audit-ready.



IN-COMPLIANCE MONITORING

The growing emphasis on AI governance frameworks, seen in Singapore, Thailand, and Indonesia, is driving demand for systems that can continuously evaluate transactions against evolving regulations.²

For compliance officers and regulators, the priority is confidence. AI-driven decisions must align with policy and be explainable under scrutiny.

Agentic AI systems built with the Denodo AI SDK can automate this process by dynamically evaluating conditions and triggering workflows, while Denodo's centralized governance capabilities enable consistent policy enforcement, role-based access control, and data protection across all participating systems.

This enables AI teams to encode regulatory logic into automated workflows, while data teams can consistently apply governance policies across all systems and datasets involved.



IN CITIZEN SERVICES

ASEAN governments are rapidly expanding AI-enabled digital platforms, from Singapore's whole-of-government services⁴ to Vietnam's deployment of virtual assistants in public administration.³ These initiatives require a unified and contextual view of citizen interactions across multiple touchpoints.

For frontline service teams and policymakers, this means having access to a complete and accurate view of each citizen, enabling faster response times and more personalized service delivery.

Denodo supports this by combining semantic metadata automatically generated by Denodo Assistant with unified access to structured and unstructured data, including forms, emails, case notes, and service records, enabling AI systems to deliver accurate, personalized responses based on a complete, trusted data foundation.

AI teams can build assistants that respond with context-aware insights, while data teams semantically align and govern all underlying data to avoid inconsistencies or misinterpretation.



IN POLICY AND LEGAL ANALYSIS

Governments are increasingly applying AI to interpret regulations, assess policy impact, and support decision-making. This is particularly relevant as countries such as Vietnam and Malaysia continue to strengthen their legal and regulatory frameworks.

For policymakers and analysts, the ability to conduct multi-step analysis across regulatory and legal data is critical for making informed, defensible decisions.

Denodo can enable this by integrating unstructured data such as legislation, regulatory documents, and case records into a governed data layer, so AI outputs are grounded in authoritative sources and can be fully traced and validated.

This enables AI teams to build systems that can reason across complex legal datasets, while data teams can keep all sources authoritative, consistent, and compliant.



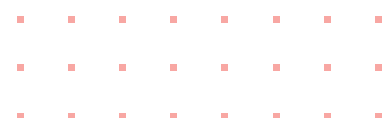
IN CROSS-AGENCY COORDINATION

National initiatives such as Singapore's whole-of-government approach⁴ and Thailand's smart city programs¹ highlight the need for secure, real-time data sharing without centralization.

For government leaders, this enables coordinated decision-making across agencies, improving outcomes in areas such as urban planning, public safety, and infrastructure management.

Denodo can enable this through a universal semantic layer that enables agencies to access and share data in real time while maintaining strict control over ownership, access, and sovereignty. When combined with agentic AI capabilities, this enables governments to orchestrate workflows across agencies; for example, coordinating responses during public health events or disaster management scenarios, while maintaining governance and accountability.

AI teams can orchestrate cross-domain workflows, while data teams enable data sovereignty and governance policies to be enforced across all participating entities.





IN PUBLIC HEALTH AND EMERGENCY RESPONSE

The need for timely, coordinated action is especially critical in this setting. ASEAN governments are increasingly integrating data across healthcare systems, mobility platforms, and public safety agencies to improve responsiveness.^{1,2}

For public sector leaders, timely access to accurate, trusted data is essential for making decisions that directly impact public safety and resource allocation.

Denodo can support this by enabling real-time data access across distributed environments while keeping all interactions governed, secure, and auditable, which is essential for maintaining public trust.

This enables AI teams to build responsive systems that adapt to evolving situations, while data teams keep data flows secure, governed, and reliable under high-pressure conditions.

From Data to Outcomes: Transforming Public Finance Oversight

A national department of finance faced fragmented financial data across more than 60 entities, limiting visibility and compliance oversight.

By implementing The Denodo Platform and agentic AI capabilities, the department created a real-time compliance system that enabled continuous monitoring, automated audits, and dynamic policy alignment. This was enabled not only by real-time data integration, but also by Denodo's ability to enforce consistent governance, optimize query performance across distributed systems, and provide traceable data lineage, so every compliance decision could be audited, traced to its underlying data sources, and justified under regulatory scrutiny.

This transformation illustrates a broader principle: when data is unified semantically and governed consistently, AI can move beyond analysis to operational execution, a capability directly applicable to revenue authorities and finance ministries across ASEAN.



Conclusion: Building Trusted AI at Scale

ASEAN's AI opportunity is substantial, but realizing it requires closing the gap between ambition and execution.

This gap is not primarily technological; it is foundational. Governments must establish data environments that enable AI systems to operate with trust, transparency, and accountability. Closing this data divide is therefore not just a technical priority, but a strategic requirement for scaling trusted AI across ASEAN governments.

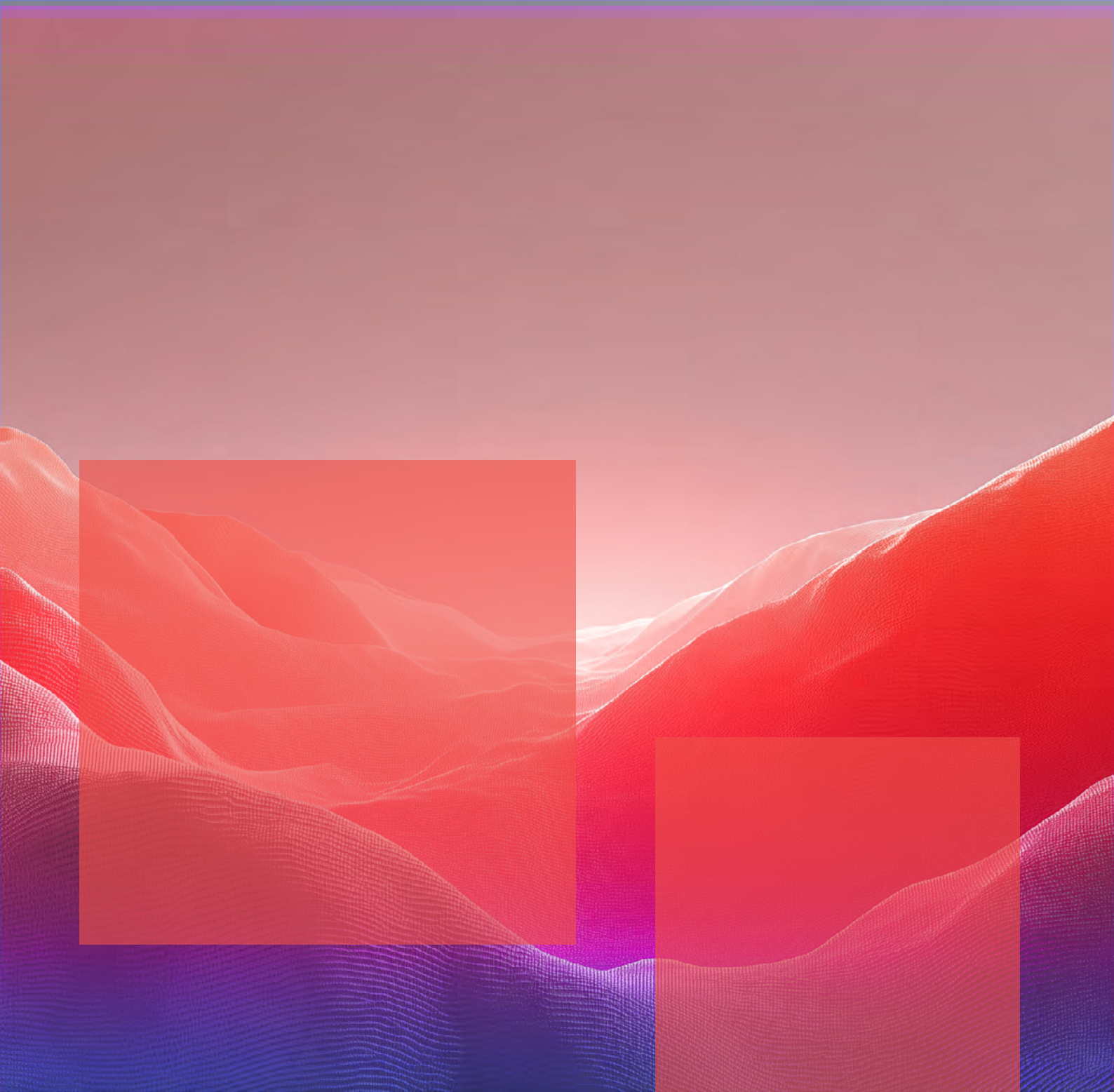
Equally important, they must enable alignment across policy and operational stakeholders, AI teams, and data teams, so all participants can contribute to and trust AI-driven outcomes.

Denodo enables this by delivering real-time, contextual, and governed data across distributed systems. **By combining semantic data abstraction, real-time data integration, support for both structured and unstructured data, and AI enablement through DeepQuery and the AI SDK, Denodo delivers the AI data layer that creates active context: a single, trusted, governed foundation for scalable AI.**

The result is a shift from isolated AI pilots to trusted, operational AI systems, **capable of delivering explainable, policy-aligned decisions at national scale.**

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Denodo is the AI data layer company. The award-winning Denodo Platform powers trustworthy agents and applications, transforming enterprise data into reliable insights for analytics and self-service. Organizations worldwide deploy Denodo alongside their data lakehouses to deliver AI-ready, business-ready data in a fraction of the time—achieving up to 4x faster time to insight, 345% ROI, and 10x better performance.

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