



EBOOK

Trusted, AI-Ready Data for Modern Healthcare Systems

From fragmented systems to connected, patient-centric care. How trusted data products accelerate experience, compliance, and AI-ready decisioning.



CONTENTS



CHAPTER 1:
The Moment of
Reinvention



CHAPTER 2:
The AI-Ready Data
Challenge



CHAPTER 3:
Logical Data Management:
Connecting What Matters



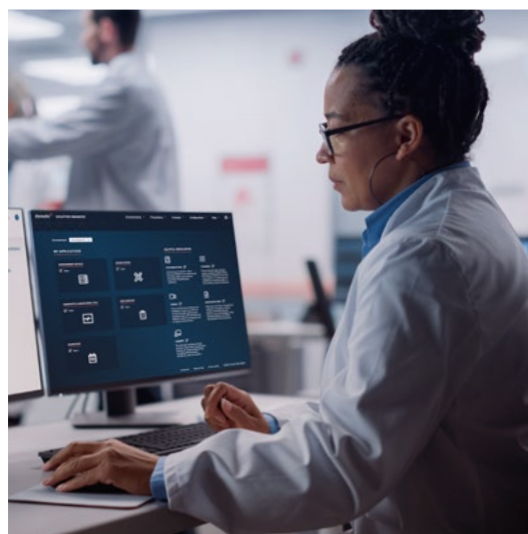
CHAPTER 4:
Driving Impact: Personas
and Data Challenges



CHAPTER 5:
Data Products: Turning
Healthcare Data into
Actionable Insights



CHAPTER 6:
The Use Cases Powering
Modern Healthcare
Provider Systems



CHAPTER 7:
Proof in Action:
Healthcare Transformation
with Denodo



CHAPTER 8:
A New Era of Trusted
Intelligence





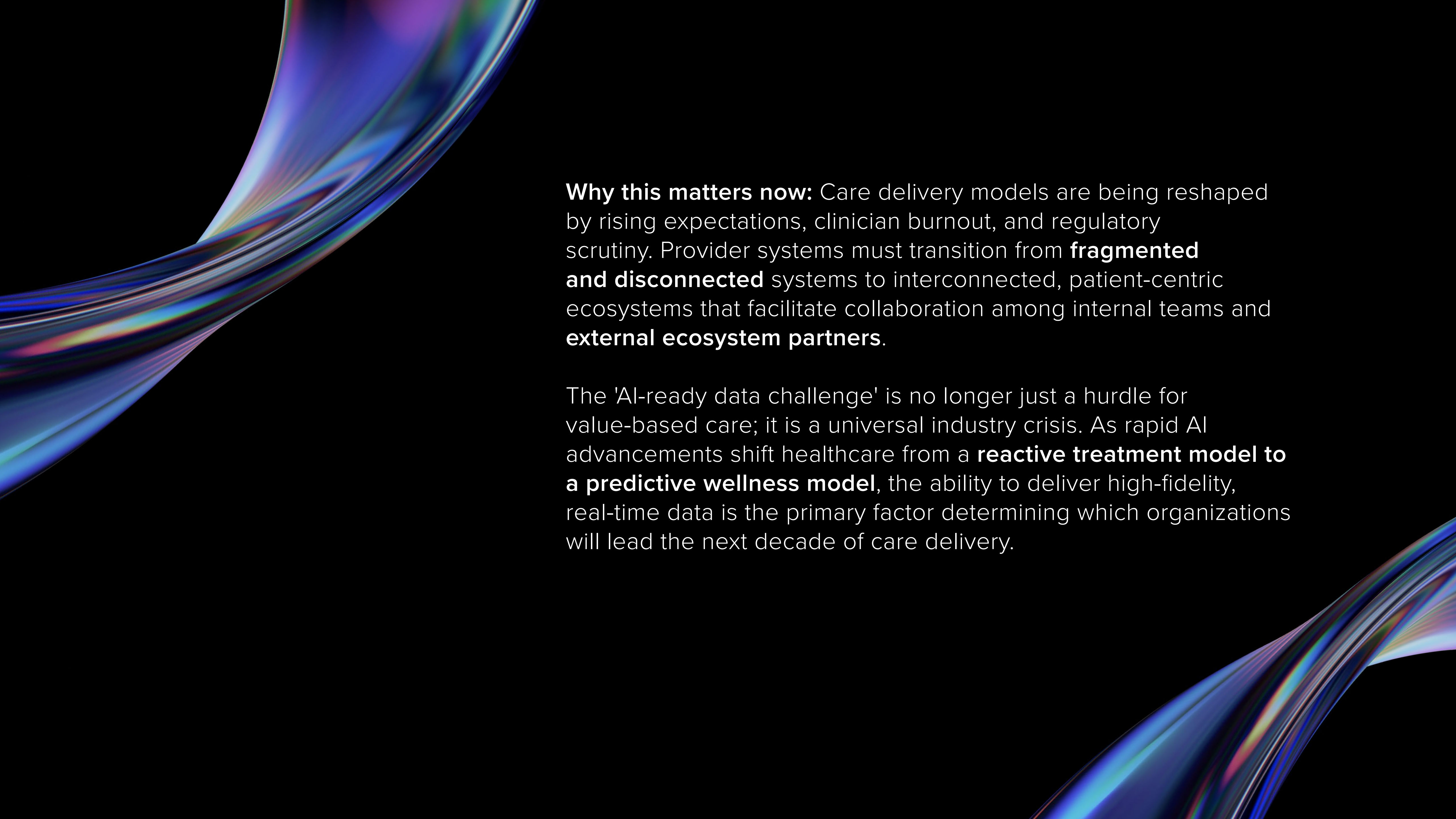
CHAPTER 1:

THE MOMENT OF REINVENTION

Healthcare at the Crossroads

For **Sant Joan de Déu Hospital**, transformation is measured in seconds. By moving from 12-hour data refreshes to **30-second, real-time clinical scoring**, they bridged the "risk gap" in pediatric care. While most **healthcare provider systems** remain at the crossroads of fragmented data and clinician burnout, leaders are proving that trusted, AI-ready data can turn clinical insights into immediate action.

Today, provider systems must balance rising patient demands for personalized care with the reality of workforce shortages and legacy silos. The shift from volume to value requires integrated insight across clinical and financial domains, while **regional interoperability mandates** add new layers of regulatory pressure.



Why this matters now: Care delivery models are being reshaped by rising expectations, clinician burnout, and regulatory scrutiny. Provider systems must transition from **fragmented and disconnected** systems to interconnected, patient-centric ecosystems that facilitate collaboration among internal teams and **external ecosystem partners**.

The 'AI-ready data challenge' is no longer just a hurdle for value-based care; it is a universal industry crisis. As rapid AI advancements shift healthcare from a **reactive treatment model to a predictive wellness model**, the ability to deliver high-fidelity, real-time data is the primary factor determining which organizations will lead the next decade of care delivery.

CHAPTER 2:

THE AI-READY DATA CHALLENGE

The Barriers to Universal
Healthcare Intelligence

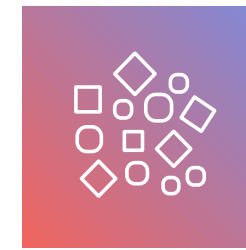




BARRIERS TO PROGRESS

Every transformation program in healthcare — whether focused on patient experience, care coordination, compliance, operational resilience, or AI — depends on reliable data.

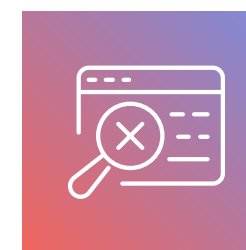
Yet for many providers, data remains the most significant barrier. Clinical, operational, and financial data is distributed across EHRs, imaging, departmental systems, devices, and cloud platforms — making it difficult to act quickly with confidence.



Siloed, fragmented data across EHRs, imaging, and cloud systems



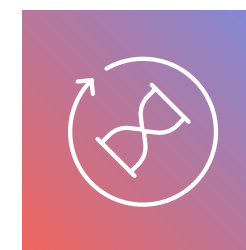
Difficulty integrating diverse clinical, operational, and financial data



Need for real-time insights from transient sources (IoT devices, wearables, monitoring systems)



Regulatory uncertainty and heavy compliance burdens (HIPAA, GDPR, interoperability rules)



Clinician burnout worsened by manual processes and poor data usability

Disconnected data increases risk and slows patient outcomes, clinician efficiency, compliance, and innovation across healthcare delivery.

The path forward requires a new approach: managing data logically rather than physically, so teams can access live data, get the right data with context, and apply centralized governance across the full estate.

CHAPTER 3:

LOGICAL DATA MANAGEMENT: CONNECTING WHAT MATTERS

One logical foundation for AI-ready
healthcare provider system intelligence





Healthcare transformation accelerates when operations, clinical leaders, compliance teams, and technology can act on the same trusted data foundation.

Logical data management makes this possible by connecting fragmented and disconnected data landscapes and delivering it with governance and control, so teams can move faster without losing compliance or confidence.

The Denodo Platform operationalizes this approach, enabling organizations to integrate distributed sources, apply semantic governance, and securely expose trusted data to analytics, AI, and applications.

WITH DENODO, HEALTHCARE PROVIDER SYSTEMS CAN:

Enable AI-ready healthcare intelligence through a logical approach that connects data across clinical and operational domains

Standardize cross-system communication by exposing legacy and modern data sources through **FHIR-compliant APIs**, ensuring seamless integration with the broader healthcare ecosystem.

Reduce friction across care coordination by delivering trusted, real-time access to patient and operational signals

Strengthen privacy and governance with centralized policies enforced across fragmented and disconnected data landscapes

Accelerate analytics and self-service consumption through reusable, governed data products

Support interoperability and ecosystem collaboration with governed data-sharing services

Power trustworthy operational AI and agent-driven workflows using governed, real-time data within enterprise guardrails

Publish reusable, governed, AI-ready data products that scale across use cases

Denodo helps healthcare teams connect what matters and move faster with control — turning distributed, sensitive healthcare data into trusted intelligence for every critical decision.



BRIDGING THE INTEROPERABILITY GAP

To meet global standards, the Denodo Platform acts as a logical abstraction layer that standardizes cross-system communication. By exposing legacy EHR and modern cloud data through **FHIR-compliant APIs (Fast Healthcare Interoperability Resources)** and HL7, providers can achieve seamless interoperability without the cost of a full 'rip-and-replace.' This architecture provides the governed, real-time data streams required to power **Agent-driven AI workflows** and Large Language Models (LLMs) within enterprise security guardrails.



CHAPTER 4:

DRIVING IMPACT: PERSONAS AND DATA CHALLENGES

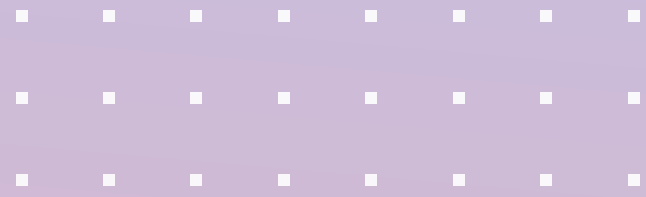
How leaders align around trusted
data to drive system-wide change



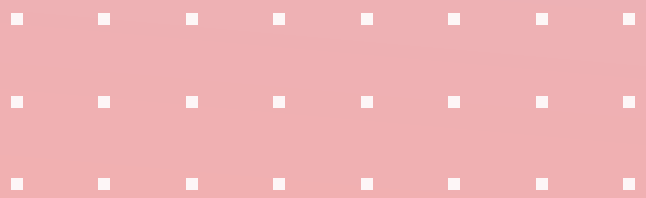
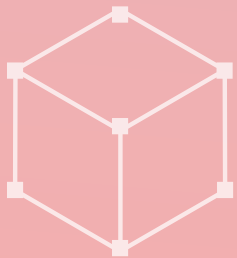
THE LEADERS DRIVING CHANGE IN HEALTHCARE PROVIDER SYSTEMS

The transition to a connected **healthcare provider system** is driven by leaders with different priorities — but a shared dependency on trusted data.

	LEADER	CORE MISSION	DATA CHALLENGE	WITH DENODO...
	Operational Leaders (COOs, CFOs, Heads of Operations)	Drive efficiency, resilience, and cost control across the enterprise.	Operational visibility is fragmented across staffing, capacity, clinical throughput, and financial systems — limiting real-time decisioning.	Gain trusted, real-time operational insight to optimize resources, reduce friction, and sustain care delivery at scale.
	Clinical Operations and Care Delivery Leaders	Optimize the care environment to improve outcomes and staff retention.	"Information Overload": Frontline teams are buried in raw data but lack real-time, actionable context at the point of care.	Streamline the point of care: Deliver a unified "Patient 360" that removes the administrative "data tax," enabling teams to focus on patients, not screens.



LEADER	CORE MISSION	DATA CHALLENGE	WITH DENODO...
Risk & Compliance Leaders (Chief Risk Officers, Regulatory Compliance Officers)	Ensure auditability and trust across regional regulatory and privacy mandates.	Manual, siloed processes increase audit burden and slow response to interoperability rules .	Access governed, auditable data to reduce complexity, strengthen compliance, and improve confidence in reporting.
Data and IT Leaders (CIOs, CDOs)	Build scalable foundations that unify healthcare data responsibly.	Siloed data and inconsistent governance prevent reuse and slow the delivery of AI-ready capabilities.	Deploy a logical foundation that integrates distributed sources and applies semantic governance to securely expose trusted data for AI and analytics.



CHAPTER 5:

DATA PRODUCTS: TURNING HEALTHCARE DATA INTO ACTIONABLE INSIGHTS

From fragmented data to trusted,
reusable assets for analytics,
compliance, and AI





Denodo enables healthcare providers to publish AI-ready data products — curated, governed, and reusable assets designed for clinicians, administrators, compliance teams, and AI systems.

By applying a logical data management approach, organizations can standardize how data is consumed, trusted, and reused — without having to copy or move it — turning complex, fragmented and disconnected data landscapes distributed data into shared intelligence.

BRONZE DATA PRODUCTS

Unify raw, real-time healthcare data

Bronze data products provide unified access to raw, real-time data from EHRs, imaging systems, wearables, monitoring devices, and operational platforms. These products preserve source granularity while making data accessible through a governed logical layer — enabling teams to work with timely signals without creating new silos.

SILVER DATA PRODUCTS

Apply governance, quality, and standard definitions

Silver data products apply business rules, standard definitions, and access policies. Data is refined and contextualized across clinical and operational domains, with embedded governance by design — so clinicians, analysts, compliance teams, and AI builders work from consistent definitions.

GOLD DATA PRODUCTS

Deliver outcome-ready insights at scale

Gold data products deliver trusted, business-ready views built for specific audiences and use cases — powering dashboards, advanced analytics, AI models, and operational applications across clinical, operations, compliance, and strategy teams. Built on governed Bronze and Silver layers, they can be confidently reused to accelerate time-to-value.

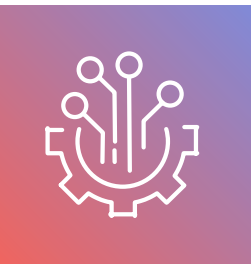


WHY DATA PRODUCTS MATTER IN HEALTHCARE PROVIDER SYSTEMS

Data products turn healthcare data into reusable intelligence that drives speed, scale, and trust — enabling organizations to:



Scale analytics and AI with consistent, governed inputs



Reduce friction between operational, IT, and data teams



Improve decision-making across experience, compliance, and care delivery



Move faster without sacrificing governance or control

In the next chapter, we map these data products to five high-impact healthcare provider use cases.

CHAPTER 6:

THE USE CASES POWERING MODERN HEALTHCARE PROVIDER SYSTEMS

**Five high-impact use cases built on
trusted, governed data products**

The following use cases show how trusted data products accelerate experience, compliance, operational performance, and AI-ready decision making across healthcare provider systems.



Total Experience Transformation

Harnessing data to unify patients, clinicians, and systems for seamless care.

Drivers: Patients expect digital-first personalized journeys; clinicians face fragmentation and admin overload; connected insights enable coordinated care.

Data Product: “Real-Time Patient Flow Intelligence” unifying EHR, IoT, scheduling, and portal data into a real-time view of each patient’s care path.

CHALLENGE

Care journeys span disconnected clinical and administrative systems. When data is fragmented, coordination slows, duplication rises, and experience suffers.

SOLUTION

A governed experience data product unifies journey signals across systems and delivers real-time context for proactive coordination and personalized engagement.



OUTCOMES

- ✓ Unified data enables seamless care coordination, achieving **up to 30% faster care transitions**
- ✓ Automating integration cuts admin burden by **up to 25%**, giving clinicians more time for patient care
- ✓ Personalized connected journeys deliver **up to 20% higher patient satisfaction scores**

Governed Healthcare Data Sharing

Unlocking secure, trusted collaboration across healthcare ecosystems.

Drivers: Rising demand for interoperability; need to accelerate research collaboration and clinical trials; ecosystem partnerships require secure, governed flows.

Data Product: “Modern care happens in a connected ecosystem, not a silo.” Denodo enables the creation of a “**Trusted Ecosystem API**” allowing providers to securely share data products with external partners. CROs, public health agencies, pharmacies, and payers can access de-identified data to support trial recruitment, disease surveillance, medication reconciliation, and faster authorizations.

CHALLENGE

Cross-organization collaboration is slowed by inconsistent exchange patterns and elevated privacy, security, and compliance risk.

SOLUTION

A governed data-sharing product provides policy-driven access and secure interoperability without uncontrolled duplication.



OUTCOMES

- ✓ Interoperable sharing can reduce clinical trial enrollment times by **up to 40%**.
- ✓ Governed exchange lowers data breach risk by **up to 30%**, while enabling seamless HIPAA/GDPR compliance.
- ✓ Integrated datasets boost research efficiency by **up to 25%**, enabling evidence-based advancements.

Holistic Compliance and Risk Mitigation

Strengthening governance and sustainability with unified, auditable data flows.

Drivers: Rising obligations (HIPAA, GDPR, interoperability mandates); increased ESG accountability expectations; high penalties and burden from fragmented compliance.

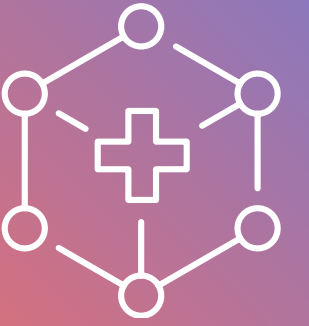
Data Product: “GRC & Compliance Kit” consolidating operational, regulatory, and ESG data into a single governed framework with audit-ready reporting.

CHALLENGE

Manual reporting, inconsistent data definitions, and distributed controls increase audit burden and risk exposure.

SOLUTION

A compliance and risk data product unifies governed reporting, lineage, and standardized definitions across domains.



OUTCOMES

- ✓ Automated data flows reduce compliance reporting time by **up to 40%**.
- ✓ Unified audit-ready data lowers penalty risk by **up to 30%**, enabling continuous alignment with regional mandates.
- ✓ Transparent governance supports trust with investors and regulators, with **up to 20% higher reporting confidence**.

Population Health Management

Leveraging precision medicine and population health to deliver smarter outcomes.

Drivers: Growing demand for precision medicine; shift to proactive management; expanded patient engagement through apps, wearables, and remote care tools.

Data Product: “Personalized Care Profile” integrating genomic, clinical, and lifestyle data to enable predictive risk scoring, tailored plans, and proactive intervention.

CHALLENGE

Patient context is distributed across clinical systems and remote data sources. Without a unified profile, personalization and early intervention are limited.

SOLUTION

A patient-profile data product unifies signals and governance to power predictive insights and care personalization.



OUTCOMES

- ✓ Personalized insights improve outcomes by **up to 25%**.
- ✓ Predictive alerts and monitoring cut readmissions by **up to 15–20%**.
- ✓ Connected experiences increase loyalty with **up to 20% higher patient retention and trust**.

Operational Intelligence

Driving efficiency, cost savings, and workforce resilience through real-time insights.

Drivers: Mounting cost pressure; workforce shortages strain scheduling and service delivery; volatility and disruption demand resilient operations.

Data Product: “Predictive Operational Command Center ” integrating ERP, workforce, supply chain, and IoT data into a unified real-time view for predictive staffing and proactive issue resolution.

CHALLENGE

Strategic and operational decisions are constrained by fragmented visibility across finance, staffing, capacity, and supply chain signals.

SOLUTION

A governed operational intelligence product unifies real-time operational data for faster data, for faster resource optimization and predictive staffing.



OUTCOMES

- ✓ Automated insights drive **up to 15% savings in operational spend**.
- ✓ Better resource allocation (workforce and supply) improves utilization by **20%**.
- ✓ Real-time visibility strengthens operational resilience, maintaining care continuity despite external volatility.

CHAPTER 7:

PROOF IN ACTION: HEALTHCARE TRANSFORMATION WITH DENODO

Customer story snapshots that show trusted data powering real-time insight

These customer snapshots bring the previous chapters to life. Each example shows how a logical, governed approach turns healthcare complexity into trusted, real-time insight that supports clinical decisioning, operational performance, compliance, and AI-ready transformation.



Customer Story Snapshot: Sant Joan de Déu Hospital

Primary focus: Real-time clinical risk scoring and AI-driven monitoring for pediatric care.

CHALLENGE

Sant Joan de Déu Hospital needed to improve timeliness and consistency of clinical monitoring across complex systems and manual workflows. In critical scenarios, delayed insight can mean delayed intervention. The hospital also needed a secure approach that supports both care teams and research use — without compromising data governance.

APPROACH

Sant Joan de Déu built a real-time data architecture using Denodo as the semantic layer and AWS as the cloud foundation. Denodo unified access to hospital systems and enabled secure data sharing for care teams and researchers. This logical approach supported real-time clinical dashboards and AI-driven analytics while maintaining control over sensitive data.



SJD Sant Joan de Déu
Barcelona · Hospital

OUTCOMES

- ✓ Real-time monitoring with data updated every **30 seconds**, replacing manual intervals of **8–12 hours**.
- ✓ Live clinical risk scoring, supporting scenarios such as sepsis and bronchiolitis monitoring.
- ✓ Secure, governed access to sensitive and anonymized data to support both care delivery and research collaboration.

Customer Story Snapshot: Fresenius Medical Care

Primary focus: Streamlining integration and strengthening governance across SAP and non-SAP data sources.

CHALLENGE

Fresenius Medical Care required agile data management to rapidly turn scientific intelligence into improvements in products and services for patients with renal disease. But its data landscape included both SAP and non-SAP sources, with middleware-based integration that was time-consuming and resource-intensive. The organization needed faster access to data across diverse systems for analytics and reporting, while strengthening governance for sensitive healthcare information.

APPROACH

Fresenius implemented the Denodo Platform as a logical data management layer to streamline integration and accelerate access. Denodo unified access across heterogeneous sources, supported semantic alignment, and reduced reliance on brittle point-to-point integration patterns. This enabled faster, more consistent consumption of data for reporting and analytics, with improved control.



OUTCOMES

- ✓ Streamlined, consistent access across SAP and non-SAP systems.
- ✓ Faster delivery of analytics and reporting by reducing integration friction.
- ✓ Improved governance and cataloging approach to support sensitive healthcare data management.

Customer Story Snapshot: North American Kidney Care Provider

Primary focus: Clinical platform modernization with hybrid delivery and architectural insulation.

CHALLENGE

This organization launched a strategic initiative to reinvent its core clinical documentation environment to support patient-centric kidney care at scale. Before Denodo, the legacy clinical system was decentralized across a large clinic network, with overlapping systems and evolving architectures. As modernization progressed, the program required a way to maintain continuity and trust while migrating toward Google Cloud — without tightly coupling consuming applications to changing sources.

APPROACH

The organization aligned Denodo with its Application Integration function, using it as a data virtualization layer for both on-premises and cloud consumers. Denodo served as an abstraction layer that insulated consumers from architectural change. It also enabled business users to view data from legacy sources in conjunction with new databases as rollout progressed — supporting a controlled transition while maintaining trust in the data.



OUTCOMES

- ✓ Consumers insulated from shifting architectures during cloud migration.
- ✓ Ability to view legacy and new data together during rollout to support continuity and validation.
- ✓ Faster delivery by reducing complexity of multi-source integration patterns

Customer Story Snapshot: Top U.S. Pediatric Health System

Primary focus: Federated analytics delivery, reuse, and accelerated insight at enterprise scale.

CHALLENGE

This pediatric health system set out to unify hospital data and processes across a complex organization with nearly 200 divisions. Before Denodo, teams faced barriers created by connecting multiple sources, supporting varied ingestion methods, and working across siloed data that limited reuse — often forcing teams to start from scratch. The organization also needed to maintain analytical output sustainably while increasing visibility into data assets and data usage.

APPROACH

The health system implemented Denodo as a unifying layer to support scalable infrastructure and a shared enterprise approach — while maintaining autonomy for domain-specific analytics. This enabled teams to reduce friction in integration, streamline sharing of data assets, and build a more sustainable analytics operating model aligned to enterprise supportability and domain delivery.



OUTCOMES

- ✓ Reduced need for data integration
- ✓ Accelerated analytics delivery
- ✓ Maintained a balance between domain independence and enterprise supportability
- ✓ Provided a streamlined platform for sharing data assets across teams

These examples reinforce one theme: when data is trusted, governed, and accessible in real time, healthcare providers can move faster with control — connecting clinical care, operations, compliance, and innovation across the care ecosystem.

CHAPTER 8:

A NEW ERA OF TRUSTED INTELLIGENCE

From fragmentation to connected,
AI-ready care powered by trusted
data products





Healthcare provider systems are moving away from **fragmented and disconnected landscapes** toward connected, patient-centric ecosystems. This evolution depends on a trusted data foundation that connects clinical care, operations, compliance, and technology across the entire enterprise.

With trusted, governed data, organizations can enable experience transformation, secure data sharing, compliance confidence, **population health management**, and real-time operational intelligence, at scale and with control.

By shifting from fragmented and disconnected systems to a connected, AI-ready ecosystem, healthcare providers do more than just manage data—they transform the very nature of care delivery. Whether it is reducing clinical trial times by 40% or providing real-time intelligence to a bedside clinician, the logical data layer is the engine of the modern healthcare business model.

This is how healthcare teams turn complexity into confident execution, and digital ambition into measurable outcomes.



TAKE THE NEXT STEP

Start building **AI-ready** data products today

Every healthcare transformation program depends on data it can trust.

Discover how Denodo helps healthcare providers to modernize their architecture and accelerate analytics and AI adoption by delivering trusted, governed data products from distributed sources — with the control required for regulated environments.

Schedule your strategy session with a Denodo expert.

SCHEDULE IT NOW