MCKNIGHT CONSULTING GROUP

2026 Trends in Analytic Architectures

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McKnight Consulting Group Partial Technology Implementation Expertise

Big/Analytic/Vector/Mixed Data Management

Data Movement and APIs

Data Management

Operational/Transactional Data Management

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DIAMANTI

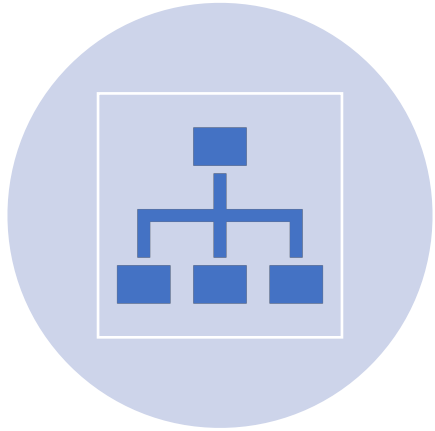
Why Are Trends Important?

- It is imperative to see trends that affect your business to know how to respond
- Plan for and deal with change
- Better to be at the beginning of the trend rather than the end
- Wants, needs, and tastes of your customer changes
- Make you a leader, not a follower
- Grow your business ideas
- Give you ideas what to improve in your business

Information Management Leaders

INFORMATION MANAGEMENT LEADERS OF TOMORROW CAN ADVANCE MATURITY WHILE ALSO SOLVING BUSINESS ISSUES

THERE'S NO BUDGET FOR "STAYING ON TRENDS"



INFORMATION MANAGEMENT LEADERS MUST PICK THEIR WINNING (I.E., MULTI-YEAR SUSTAINABLE) APPROACHES AND GET ON BOARD

2025

- **Agentic AI hit reality:** Widespread experimentation exposed limits in reasoning, reliability, and memory, slowing large-scale production impact.
- **Standards emerged fast:** MCP quickly became the de facto way models connect to data, APIs, and agent workflows.
- **Data foundations consolidated:** PostgreSQL, Zero ETL, and data sharing became core patterns for unifying transactional and analytical systems.
- **Open architectures won:** Apache Iceberg solidified its role as the standard open table format across the ecosystem.
- **AI drove real economic impact:** Productivity gains from AI accounted for the majority of U.S. GDP growth, signaling a shift from pilots to material value creation.
- Renewed interest in data
- Insane Capital Raises: Examples include OpenAI raising a staggering $40 billion, reflecting an exponential growth trajectory.

Last Year's Trends that Hit

Information Management Trends

- Simplified data architecture
- Consolidation, rationalization & backend optimization
- Optimization by reducing redundant/unused data
- Open table formats (Iceberg, Delta, Hudi) widely adopted
- Data privacy impacting business operations
- Regulatory compliance costs rising
- Data lakehouses becoming the de facto standard
- Unstructured data at parity with structured data
- Data mesh simplifying governance/security
- Data products as standard exchange mechanism
- EU AI Act impact

Artificial Intelligence Trends

- MLOps adoption
- Executives expecting natural language with data
- AI challenges (explainability, bias, hallucinations, governance)
- 2025 as the Year of AI Agents
- AI at edge
- AI companions/replicas

Broader Environment Trends

- Cloud-native principles (DevOps, containers, microservices)
- Data observability gaining ground
- Education & healthcare adoption of AI rising
- Entry-level jobs becoming harder to find due to AI
- Hybrid quantum computing investment growing
- Data engineering as highest-valued profession
- 2025 as the year of data observability
- Entry-level jobs universally harder to find

Last Year's Trends that Missed

Information Management Trends

- Unstructured data equal to structured in tooling & parity

Artificial Intelligence Trends

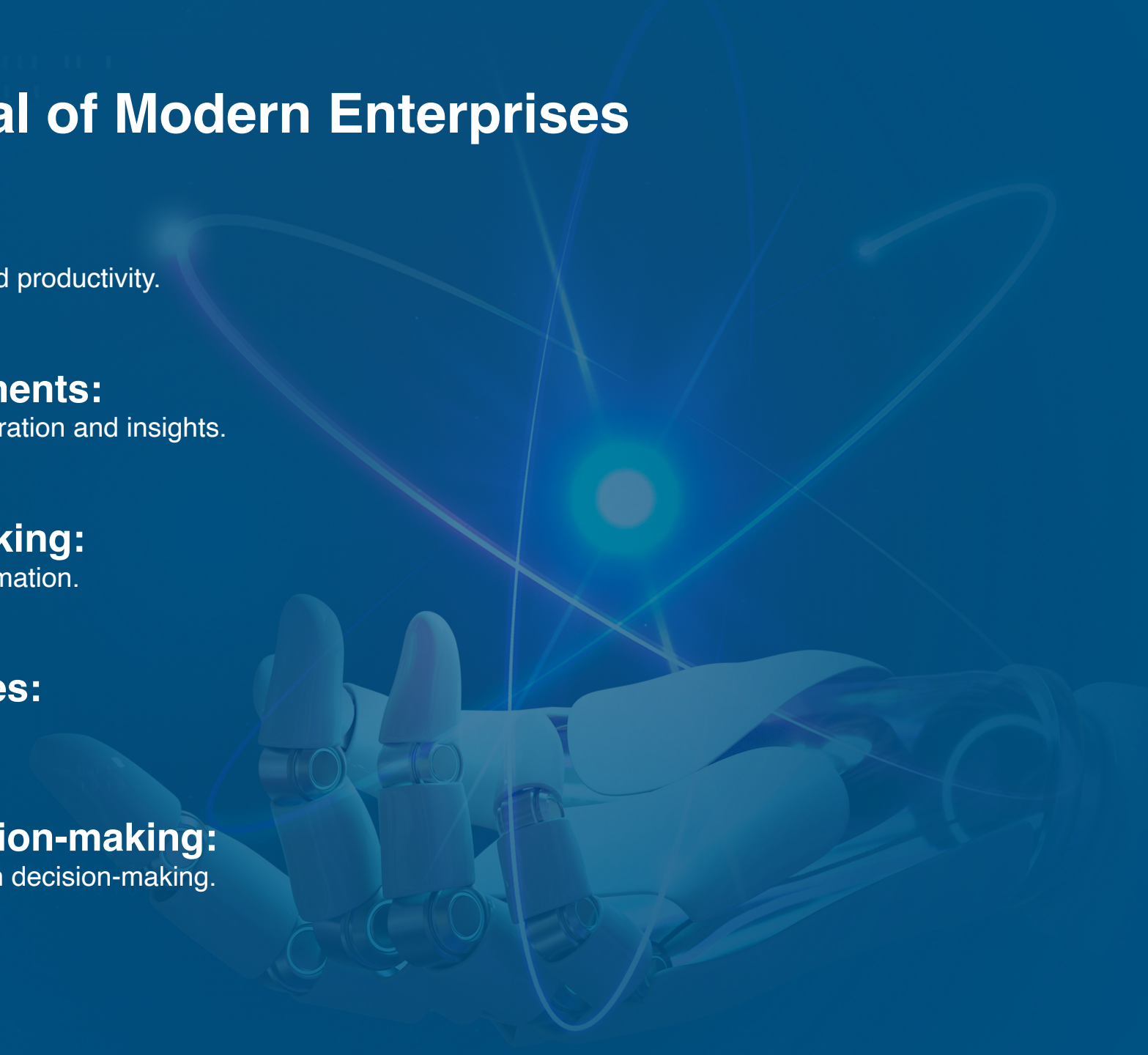
- AI agents pervasive for complex, specific tasks
- GenAI & LLM success widely evident
- Pervasive adoption of AI agents for complex tasks
- Neuromorphic/optical computing advancements
- Executives fully trusting autonomous AI decisions

Broader Environment Trends

- Hybrid quantum computing delivering exponential big-data query performance

The Goal of Modern Enterprises

- **Automating complex tasks:**
  enabling unprecedented levels of efficiency and productivity.
- **Providing smart data environments:**
  offering personalized assistance for data exploration and insights.
- **Driving proactive decision-making:**
  unlocking new levels of data insights and automation.
- **Simplifying business processes:**
  streamlining operations and improving ROI.
- **Facilitating autonomous decision-making:**
  enabling hyper-personalization and data-driven decision-making.



The World is Changing

- **Old Way:**
  Ramp up: Spend months getting familiar with the company

  Data discovery: Take hours to find and understand relevant data

  Waiting on data engineers: Spend hours to days waiting for data engineers to ingest data

  Data optimization: Wait days to weeks for data engineers to optimize data

  Dashboard creation: Spend days to weeks building business dashboards and spaces

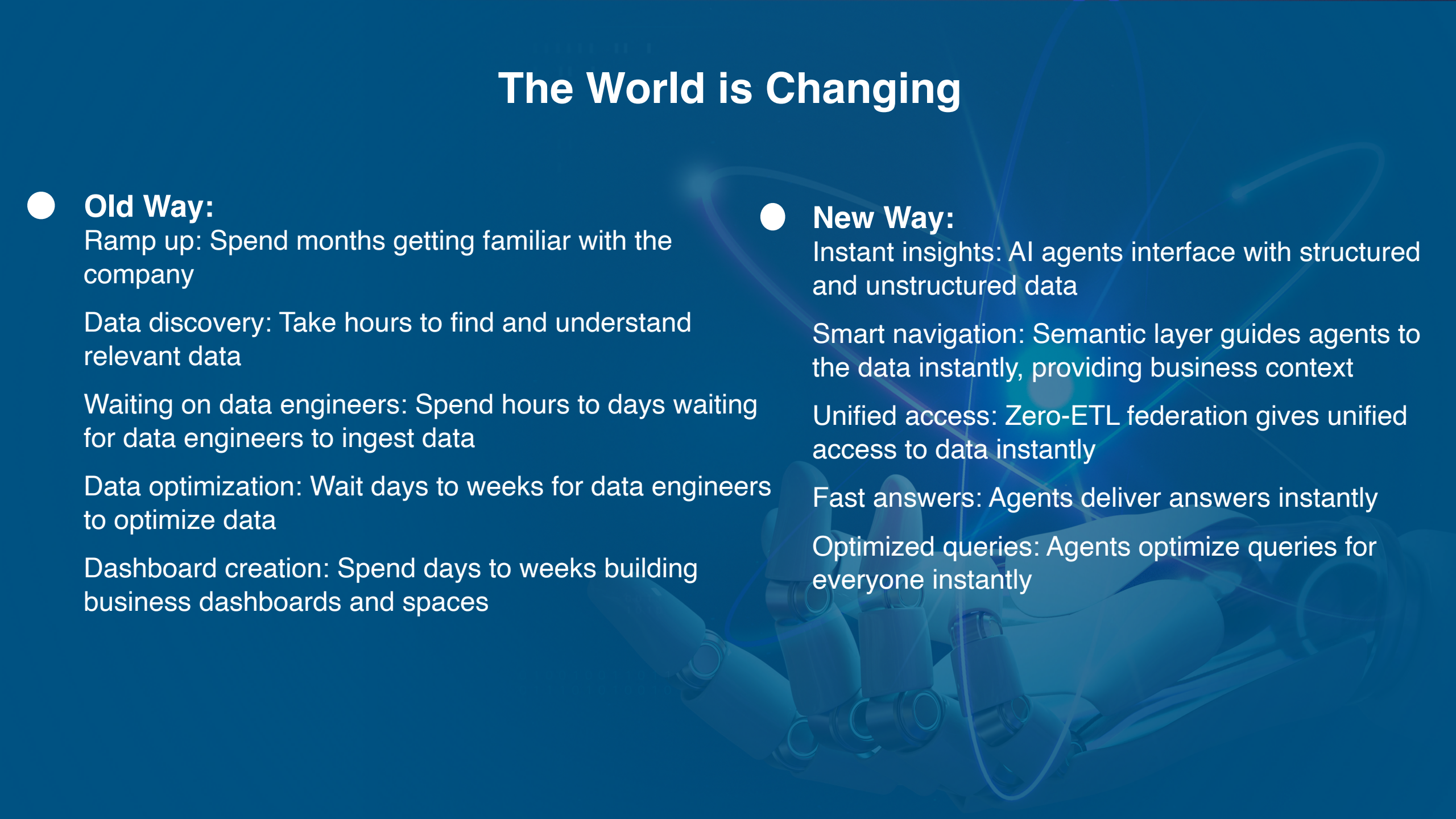
- **New Way:**
  Instant insights: AI agents interface with structured and unstructured data

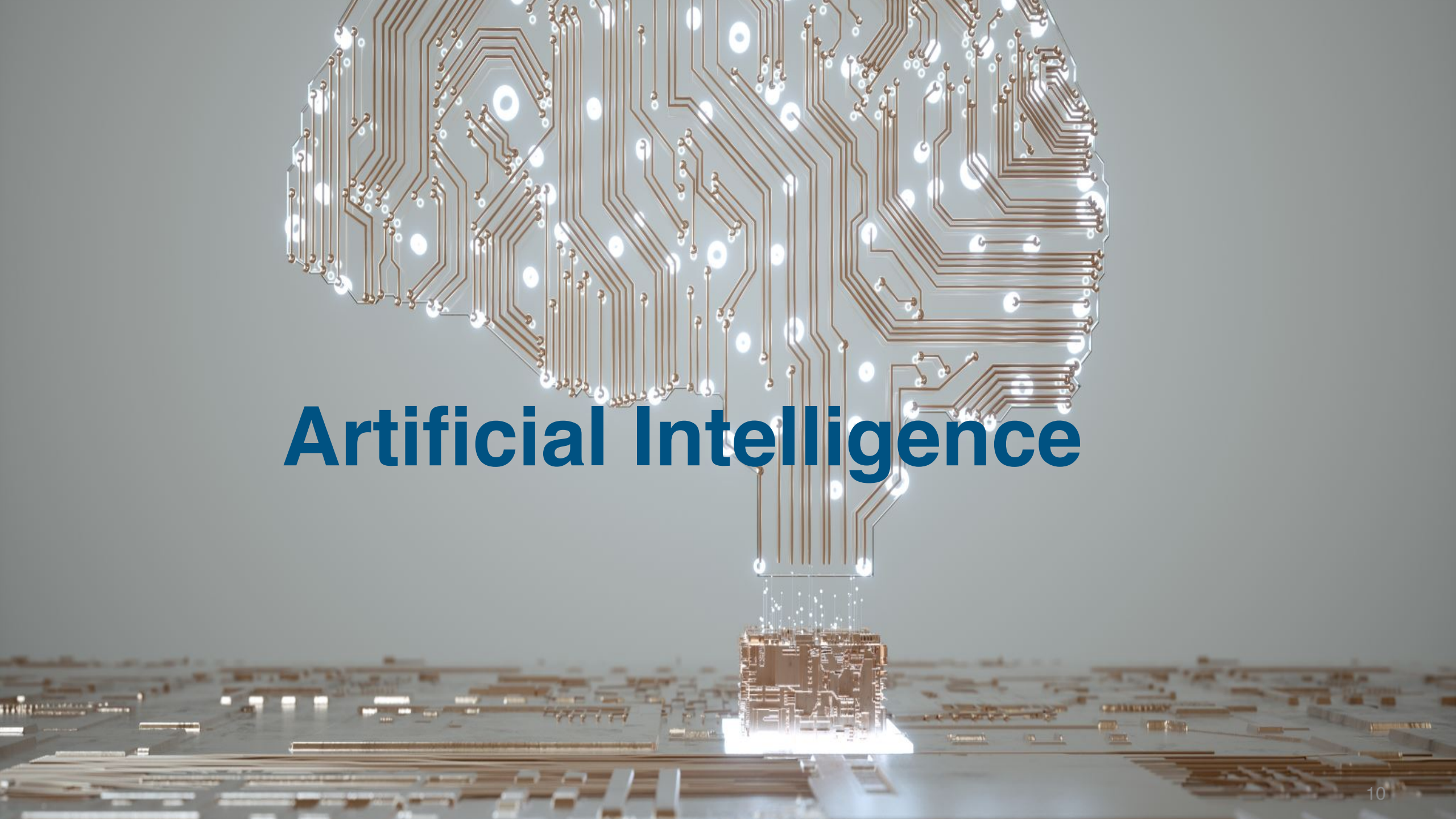
  Smart navigation: Semantic layer guides agents to the data instantly, providing business context

  Unified access: Zero-ETL federation gives unified access to data instantly

  Fast answers: Agents deliver answers instantly

  Optimized queries: Agents optimize queries for everyone instantly




Artificial Intelligence

The AI Adoption Curve: 2025–2026

- 2025 focused on pilots and partial automation
- Adoption still on flat hockey-stick blade
- 2026 marks rapid acceleration
- Autonomous execution scales
- Investment velocity increases

Best of Breed AI Architectures

Fungible AI Stacks

Smaller, More Efficient LLMs

Rapid model obsolescence as a strategic risk

Economics over raw capability

AI Agents vs Generative AI

- GenAI focused on content generation
- AI agents execute multi-step tasks
- Agents combine models, data, and software
- Workflow orchestration across systems
- Agents deliver higher enterprise ROI

From Generative AI to Agentic AI

Shift from prompt-based GenAI to autonomous AI agents

Agents reason over context and enterprise data independently

Metadata-aware knowledge layers critical for trust and accuracy

Agents surface insights without human prompting

Used for contracts, fraud detection, and hyper-personalization

On-Prem AI Infrastructure

- Rising demand for data sovereignty and compliance
- On-prem RAG platforms reduce development complexity
- Lower complexity vs DIY cloud stacks
- Lower total cost of ownership
- Mission-critical AI repatriated by 2026

Sovereign AI

- Integrated RAG platforms outperform DIY stacks
- Lower development complexity
- Lower ongoing maintenance effort
- Faster time to production
- Critical for agentic AI pipelines

Quantified ROI

- Automated customer service ~400% ROI
- High autonomous resolution rates
- Fraud detection preventing major losses
- Fraud ROI exceeding 400%
- MDM consolidation delivering recurring savings

Natural Language as the Primary Interface

- Natural language as the default control layer
- Lowering the skill barrier
- Compression of complex workflow
- Context-aware interaction
- Abstraction of underlying complexity
- Speed of iteration and experimentation
- Strategic control point

Semantic Layers as Foundation

- Semantic layers as the connective tissue
- Decoupling logic from infrastructure
- Foundation for interoperability
- Consistency and governance at scale
- Acceleration of AI deployment
- Improved reasoning and reliability
- Long-term strategic asset

2026 Outlook: The Digital Researcher

- GenAI as digital librarian phase ending
- Agentic AI acts as digital researcher
- Reads, reasons, and connects enterprise data
- Produces insights and decisions autonomously
- Marks inflection point in AI value creation

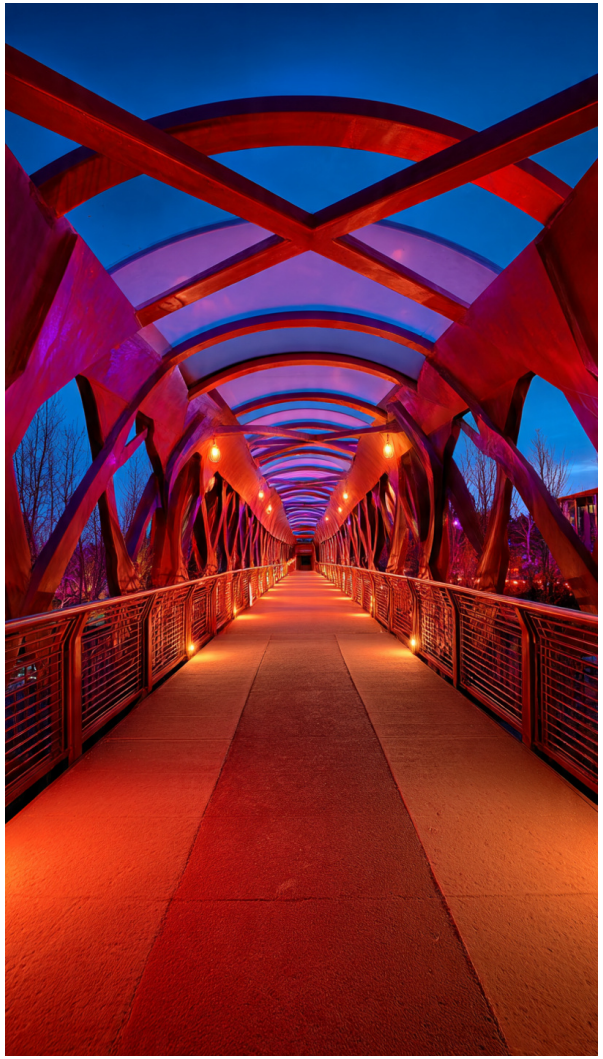
The Technical Divide

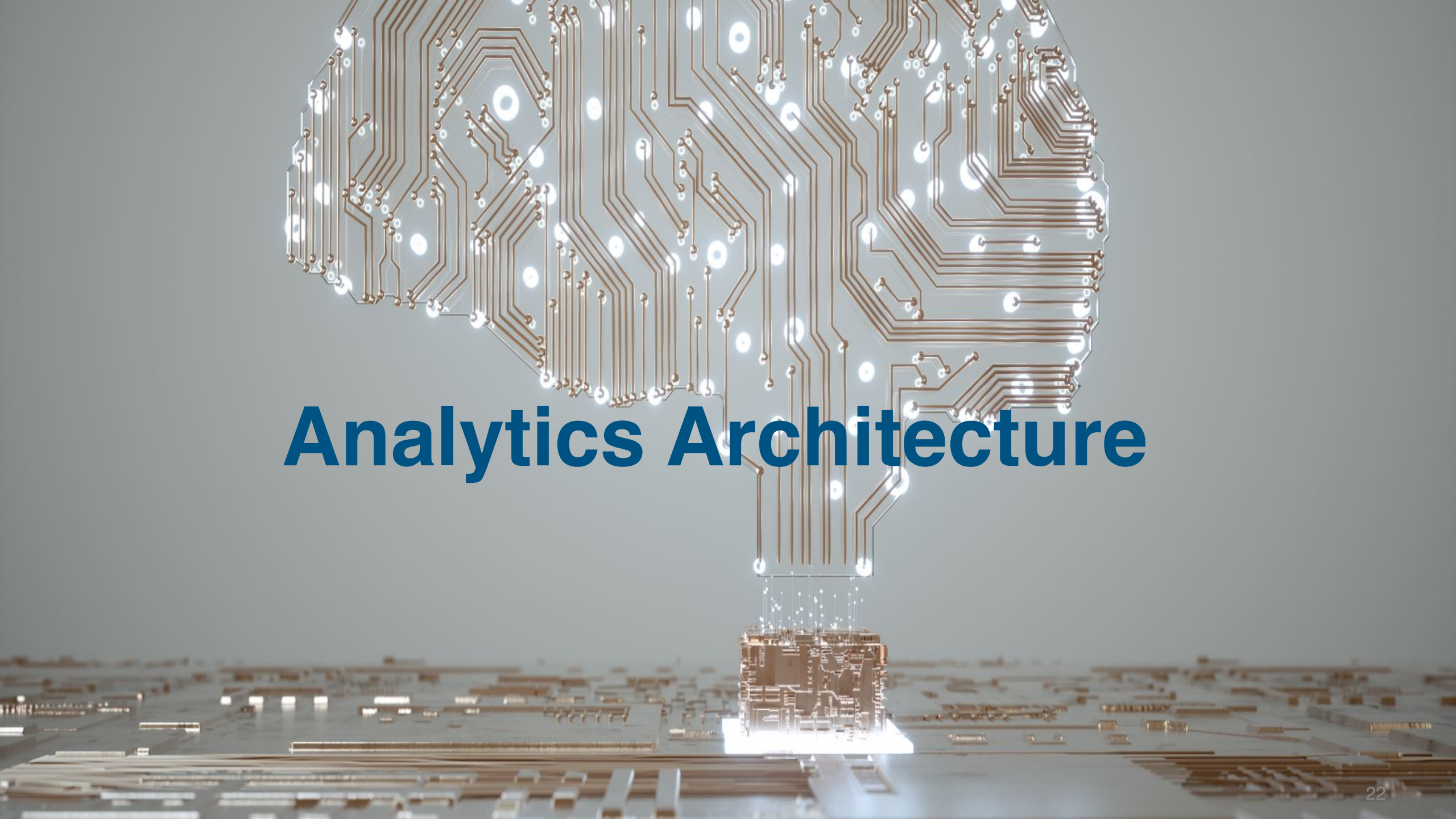
AI is leveling the field, enabling non-technical users to perform tasks once reserved for specialists; Enterprise users use AI for work they previously could not do

Advantage is shifting from pure technical skill to domain expertise paired with AI execution

Value is moving from prompt wording to providing rich business context, since models lack awareness of internal goals, data, and rules

Platforms are embedding AI to capture this context, creating lock-in as AI improves with deeper data access





Analytics Architecture

Modern Data Architectures

Icehouses: ~80% savings on incremental loads

Columnar formats accelerate analytics

Faster joins and scans

Open architectures reduce lock-in

Automated Master Data Management

- LLMs generate and enrich master data
- AI-driven entity resolution
- NER and NLU mapping records automatically
- Systems learn from stewardship decisions
- Humans focus on exceptions

Data Fabric & Semantic Layer ROI

Business data fabric reduces cognitive load

63% lower initial build cost vs DIY

72.4% reduction in data modeling effort

2.4x more cost-effective over three years

Semantic layers accelerate decision-making

Specialized Hardware & Edge AI

- Real-time inference moving to edge
- Specialized low-power AI chips
- Embedded zero-DBA databases
- Zero-ETL cloud synchronization
- Autonomous factories emerging

Unified & Multi-Model Platforms

- Move away from stitched-together point solutions
- Consolidation reduces data debt and operational complexity
- Single engines handling transactional, analytical, and NoSQL workloads
- Predictable cost and simpler administration
- Multi-model databases favored by 2026

Open Data Lake Format Dominance

- Open lake formats becoming AI and analytics foundation
- Iceberg and Delta Lake enable compute–storage separation
- 77–95% lower compute and ingestion cost vs warehouses
- Interoperability reduces vendor lock-in
- Iceberg emerging as long-term storage standard

Python-Centric Real-Time Ecosystems

- Developer preference shifting toward Python-first frameworks
- Lower memory usage than Java-based alternatives
- Up to 4.6x more cost-effective than Flink
- Faster iteration and development cycles
- AI apps reach production 3–9x faster

Distributed SQL & Transactional Performance

- Cloud-managed distributed SQL validated at scale
- Unified platforms beat by 14x price-performance
- Lower 3-year TCO for transactional workloads

Digital Analytics & Behavioral Data

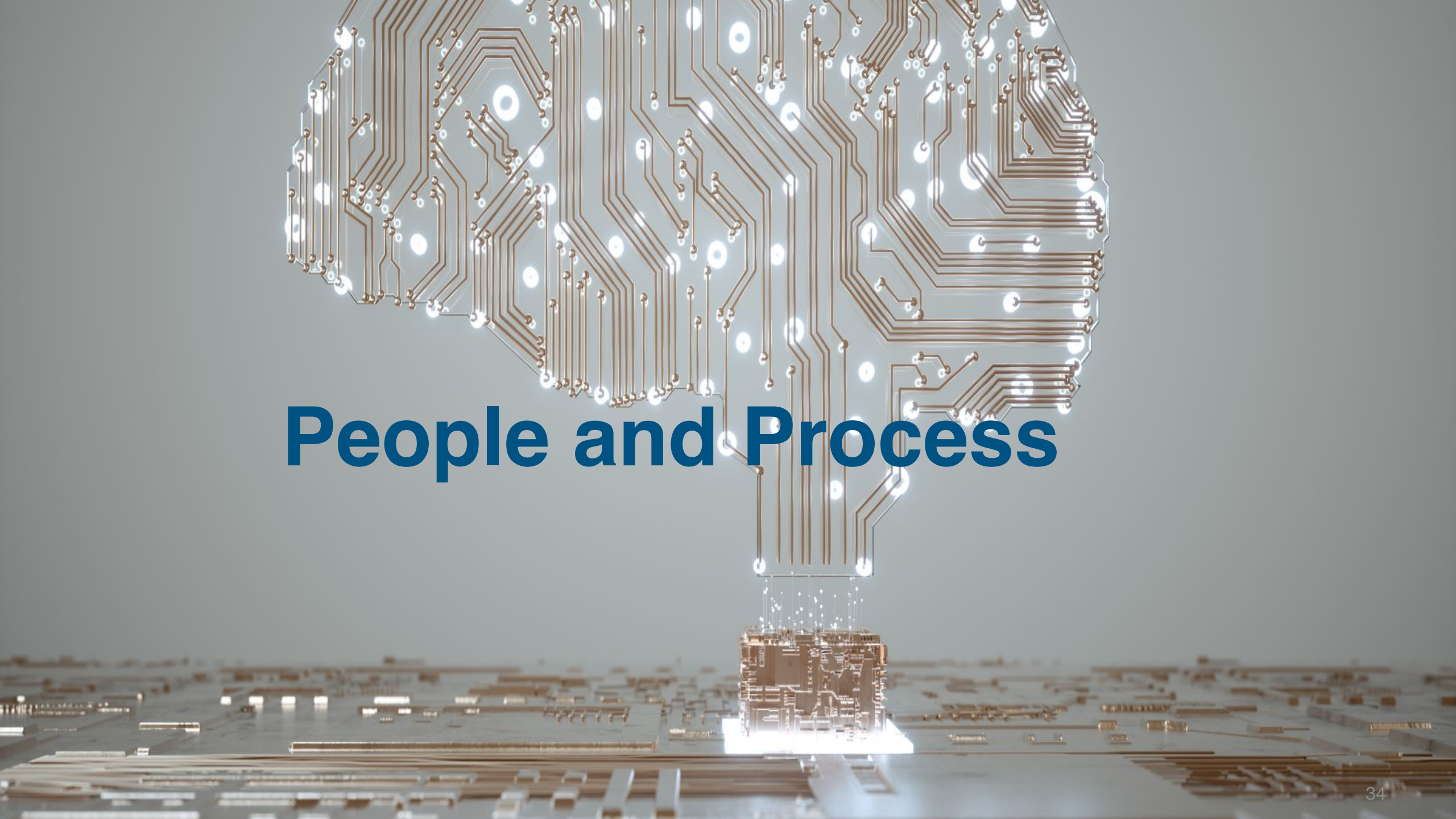
- Shift from vendor UI to warehouse-first analytics
- Using an event data platform with transformation-based accelerators results in queries that are significantly simpler and dramatically faster
- 42% less complex queries
- 6.9x faster analytics performance
- Over 99% reduction in data scanned

Foundation Concepts

- Lakehouse = open tables + compute separation
- Microservices are independently deployable
- APIs, containers, orchestration, observability
- RAG grounds LLMs in specific knowledge

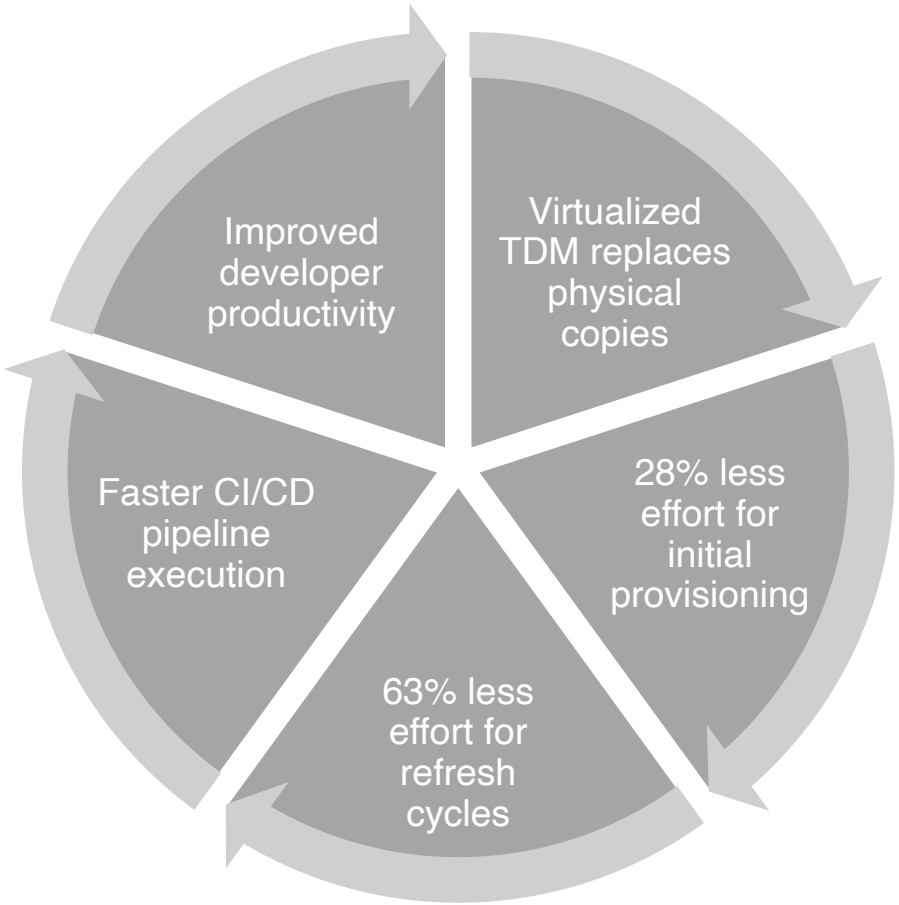
Maturing Data Architectures Misc.

- Unstructured data nearing parity with structured data
- Text, audio, and video driving competitive advantage
- Data mesh moving from theory to execution
- Decentralized ownership with shared standards
- Simplified governance and security models



People and Process

Test Data Management & DevOps Velocity



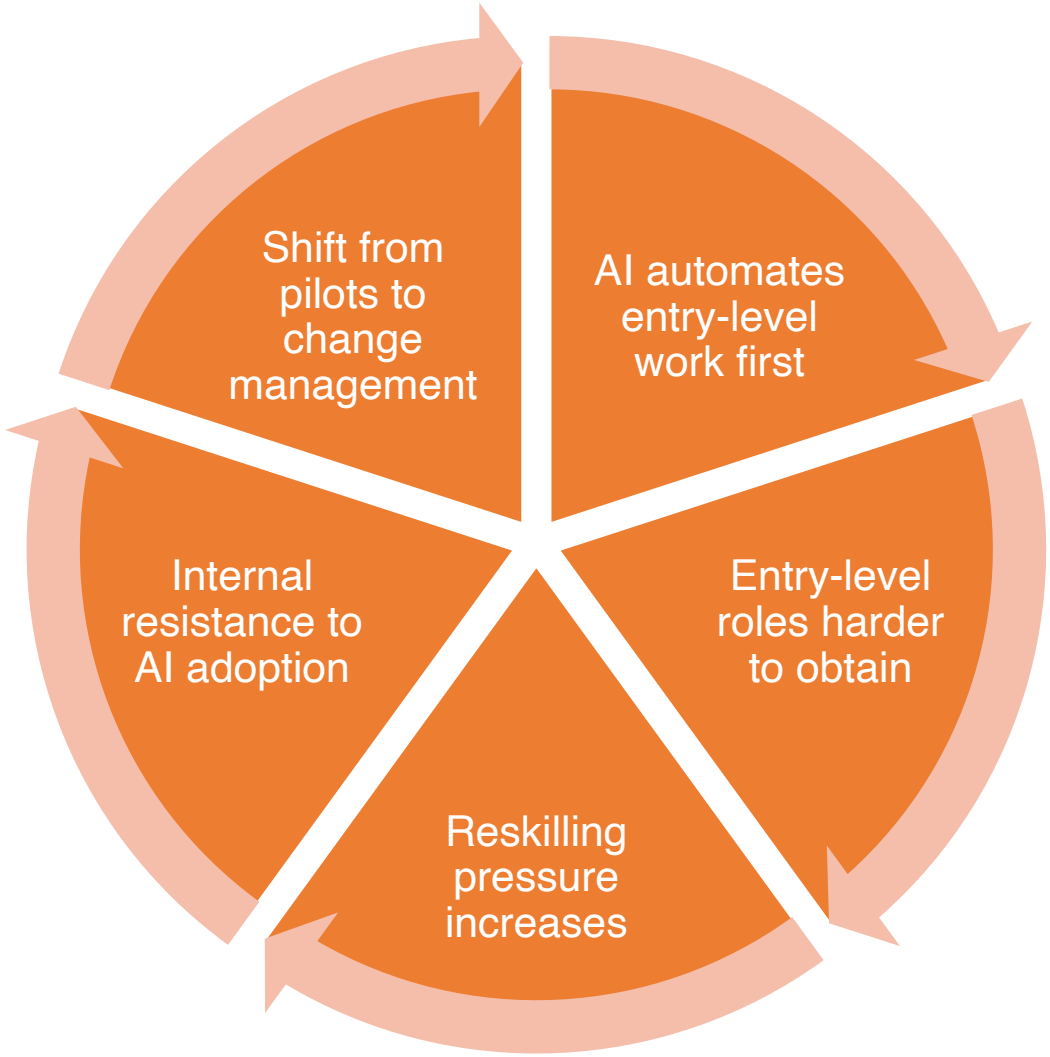
The Rise of Autonomous Digital Operations

- Accelerating AIOps spend across startups and mid-market
- Shift from AI-assisted monitoring to autonomous remediation
- Self-healing platforms resolving incidents automatically
- Agentic AI orchestrating end-to-end workflows
- Autonomous execution in use by 2026

Advanced Computing & Financial Shifts

- Early hybrid quantum traction in 2025
- 2026 as quantum investment inflection point
- Data FinOps becomes standard discipline
- Backend rationalization accelerates
- Cost-tiered storage and compute strategies

Social & Economic Impact



Emerging Enterprise Risks

- AI-generated data exceeds half of new content
- Risk of model collapse
- Data poisoning attacks
- Need for lineage and validation
- Expanded AI governance requirements

Bring Your Own Cloud (BYOC) Models

- Software deployed inside customer cloud perimeter
- Up to 60% cheaper than SaaS streaming platforms
- Improved data sovereignty and security
- Leverages reserved instances and savings plans
- Managed experience without SaaS lock-in

Cloud Marketplace Procurement Agility

- Marketplace-based procurement accelerates deployment
- Licensing reduced from weeks to minutes
- Improved time-to-value
- Standardized purchasing and billing
- Greater flexibility in enterprise buying

Evolution of Professional Roles

- AI architects essential for enterprise AI maturity
- Data engineering remains highest-value profession
- Natural-language access to data becomes table stakes
- Rise of AI ethicists, auditors, and trainers
- Trust, governance, and domain expertise prioritized

Looking Ahead to 2026

- Autonomy becomes competitive differentiator
- Agentic AI + open data converge
- Governance embedded by design
- Leaders separate from laggards
- Execution replaces experimentation

Summary

Agentic AI

- AI moves from standalone generative models to **agentic systems** that execute tasks, orchestrate workflows, and drive measurable business outcomes, with cost, latency, and scale now outweighing raw model power.

Semantic Layers

- **Semantic layers and governed data foundations** become essential, enabling interoperability, consistent meaning, faster AI deployment, and long-term value beyond individual models.

Data Architecture

- Data architectures will converge on **open formats, distributed SQL, real-time pipelines, and automated master data management** to support scalable AI decision-making.

Sovereign AI

- Infrastructure will split between **sovereign/on-prem** and **edge** for control and low latency, and cloud/**BYOC/marketplace** for flexibility and speed.

Organizational

- Organizations will adapt roles, operating models, **DevOps**, and governance as **autonomous** systems increase productivity, **ROI**, and shift human focus to **oversight**, exceptions, and strategy.

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