

Neo4j Knowledge Layer: The business case

Rob McManus, Head of Value Engineering, Neo4j
Jesus Barrasa, AI Field CTO, Neo4j

“AI will have implications for the macroeconomy, productivity, wages and inequality, but all of them are very hard to predict....

...This has not stopped a series of forecasts over the last year”



“Nobody Knows Anything”

William Goldman, 1983



“Over the course of more than a century the global economy has absorbed electrification, mass production, mechanization, industrial robotics, personal computing, the internet, and smartphones without derailing long-run growth or making human labor obsolete.”

Frank Flight, Citadel Securities, April 2026

Let's be careful out there



5%

“Only **5%** of custom GenAI tools survive the pilot-to-production cliff, while generic chatbots hit **83%** adoption for trivial tasks but stall the moment workflows demand context and customization.”

Jason Snyder, Forbes, August 2025

11%

“...these risks and challenges are keeping many global organizations in the experimentation and piloting stage of AI implementation, while a meaningful minority (**11%**) are gaining edge through AI agent deployment, scaling across functions and beginning to coordinate them across workflows.”

KPMG Global AI Pulse, April 2026

79%

“Enterprise AI adoption in 2026: Why **79%** face challenges despite high investment.”

Writers' Room. April 2026

“This time it’s different”



1990s

Based on this research, The Standish Group estimates that in 1995 American companies and government agencies will spend \$81 billion for cancelled software projects. These same organizations will pay an additional \$59 billion for software projects that will be completed, but will exceed their original time estimates. Risk is always a factor when pushing the technology envelope, but many of these projects were as mundane as a drivers license database, a new accounting package, or an order entry system.

The Standish Group

2000s

Runaway projects have been a problem in information systems (IS) for quite some time. In 1988, KPMG found that 35% of their largest clients currently had a runaway project, and in 1991 the percentage of firms increased to 60%. Plus, over 50% of the respondents considered this to be normal (Rothfeder, 1988; Cringely, 1994). The traditional definition of a runaway is any project that grossly exceeds budget and time targets but yet has failed to produce an acceptable deliverable.

Joan Ellen, Cheney Mann

2020s

Only 30% of transformations met or exceeded their target value and resulted in sustainable change; companies in this group are in the win zone. Some 44% created some value but did not meet their targets and resulted in only limited long-term change; these companies are in the worry zone. And in the woe zone, 26% created limited value (less than 50% of the target), producing no sustainable change.

Boston Consulting Group, 2020



Expectations

Results do not match the cost savings, revenue growth or reduction in risk that your organization expected.

Context

The solution implements processes in a way that's different from how your organization actually operates

IDC calculated 3-year return on investment across 9 enterprise customers



230%

3-Year ROI

Against a 12% discount rate

7.8 mo

Payback on Investment

Avg. 5.8 months to deploy

\$4M

Avg. Annual Benefit

\$116K per database/model

\$9.6M

3-Year Discounted Benefits

\$2.9M

3-Year Discounted Costs

\$6.7M

Net Present Value (NPV)

12%

Discount Factor Applied

“LLMs are amazing, but their tendency to hallucinate introduces significant risks to businesses, even as the token costs continue to mount. In an agentic world, where autonomous systems can make significant decisions over time, this cannot hold.”

Jim Webber, Chief Scientist, Neo4j

Neo4j is the backbone for GenAI



43%

**Of all GenAI Use Cases
Powered by Neo4j
knowledge graphs**

44%

**Reduction in GenAI
Model Hallucinations**

20-40%
to 2-5%

**Life Science customer
saw reduction in
hallucination rates of
>75%**

How Neo4j Improves GenAI Accuracy

Grounds LLMs in
Knowledge Graphs

Connects fragmented
docs & domain data

Cypher retrieves
structured context

Improves reasoning
& explainability

Enables natural
language data access



Graph-Powered AI Reduces Hallucinations and Boosts Answer Accuracy

510

**Complex Questions
Tested**

80%

**Improvement in
truthfulness versus
standard vector RAG.**

2X

**More than double the
number of questions
answered**

“Integration with a graph database can significantly reduce the two most significant problems holding back the exploitation of LLMs for real-world applications: hallucinations and omissions.”

Adding context to process automation



1960s

**Data Processing
Task Automation**

*Raw Compute automates
resource heavy repetitive
tasks*

Automates
discrete Business
Process, no
concept of
Business Model

1990s

**ERP
Process
Automation**

*Standardized Process Design
to vendor best practice
increases business process
efficiency*

Business
conforms to the
software's model
of itself

2010s

**RPA
Workaround
Automation**

*Orchestration and interface
speed to patch around
rigidity*

Automate human
workarounds for
rigid ERP Model

2026+

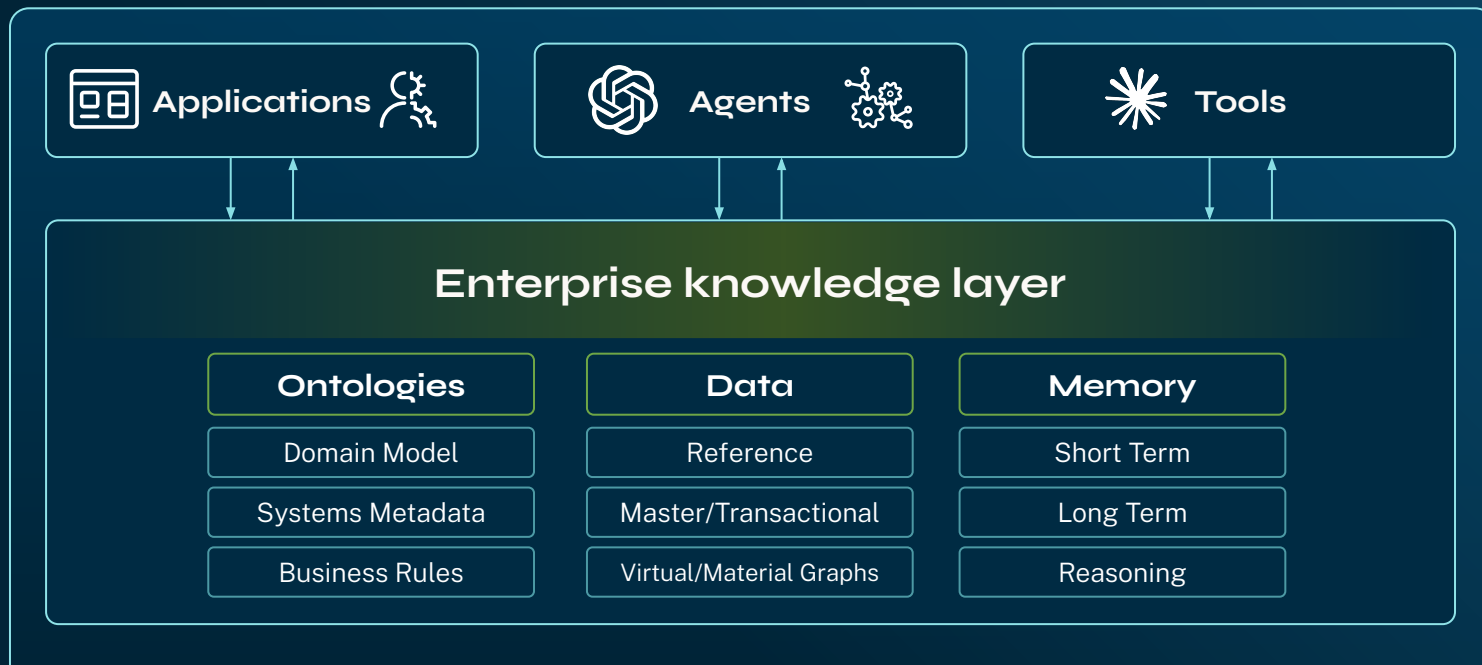
**Knowledge
Grounded
Automation
Knowledge Layer**

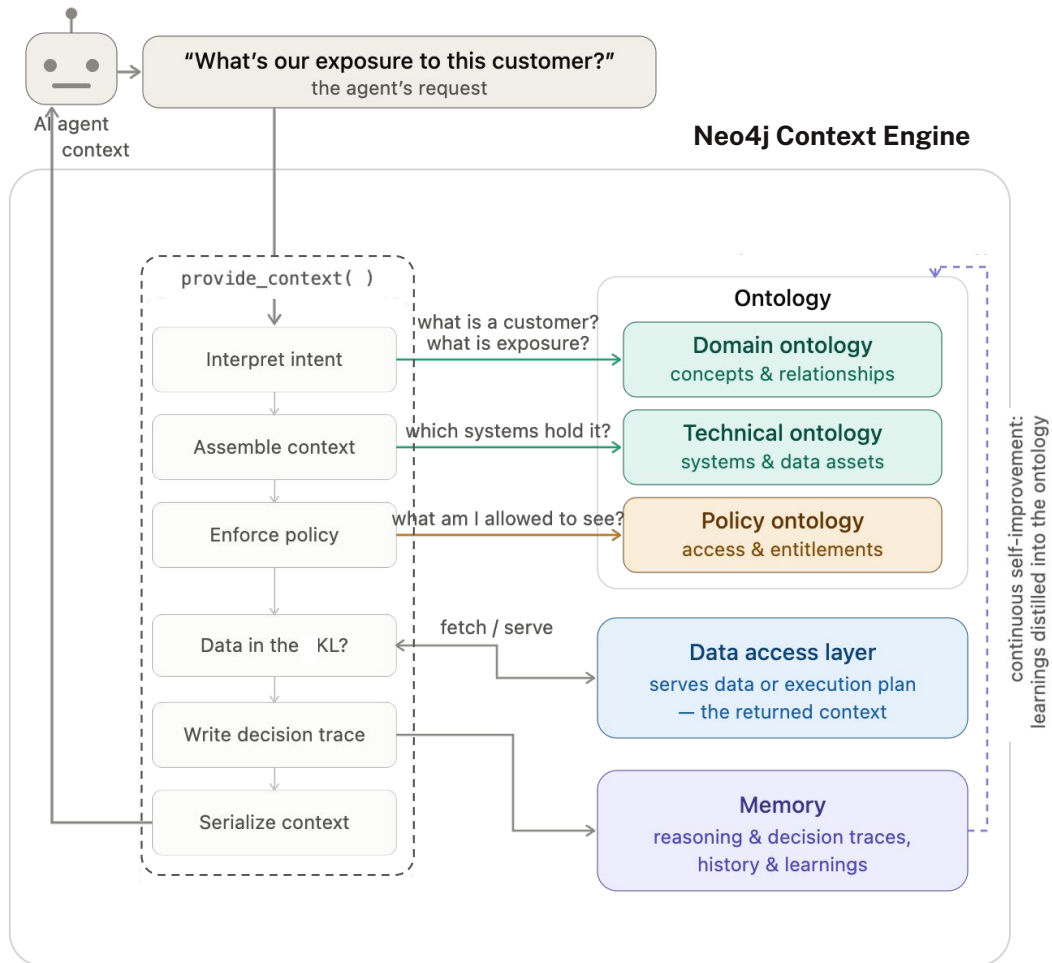
*Write the meaning down in a
way the software can read it*

Software holds your
model of your
business, improved
navigation with each
use

The differentiator in enterprise AI is **shared business context**

Same models • Same harnesses





The Knowledge Model

Policy Ontology
Access & usage rules

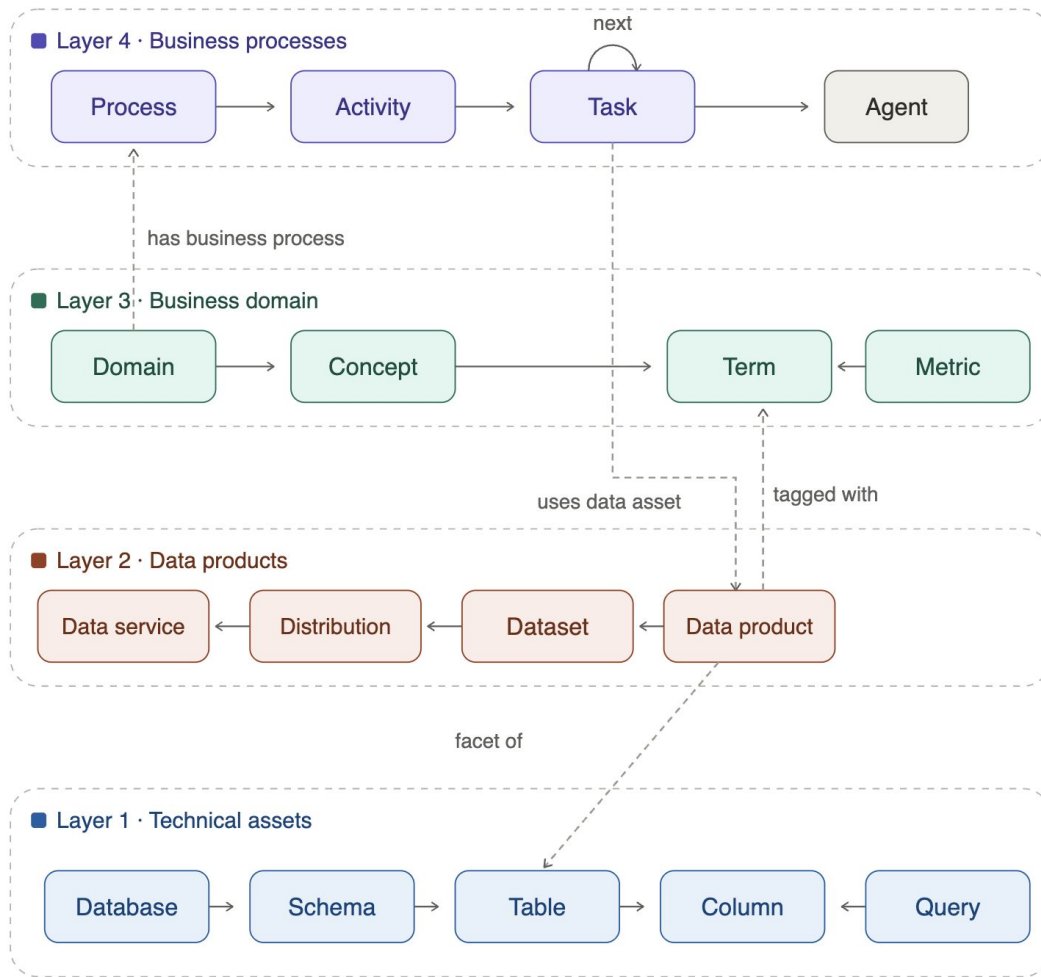
Organization Ontology
Units, rules, ownership

Business Process Ontology
Tasks, activities, decision points

Domain Ontology
Business entities & relationships

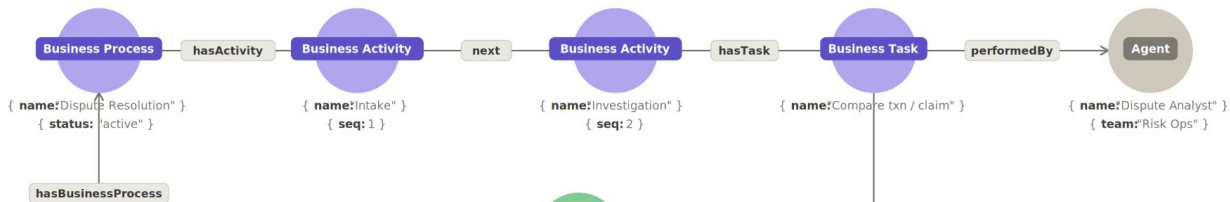
Data Product Ontology
Links business concepts to systems

Technical Ontology
Systems, sources, data sets

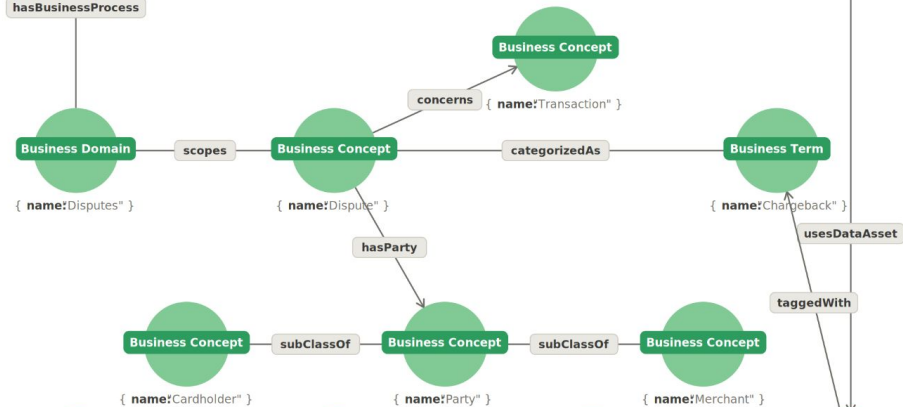




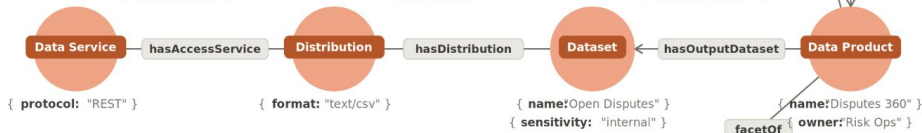
LAYER 4 - Business processes



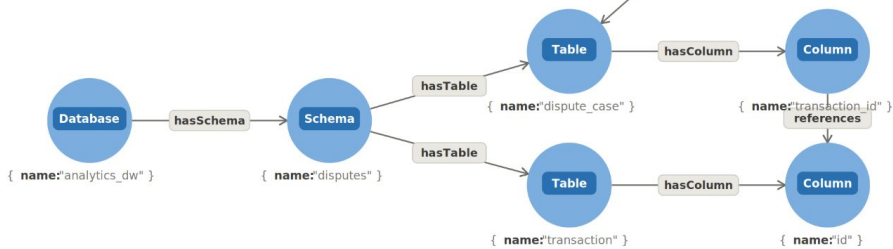
LAYER 3 - Business domain (ontology)

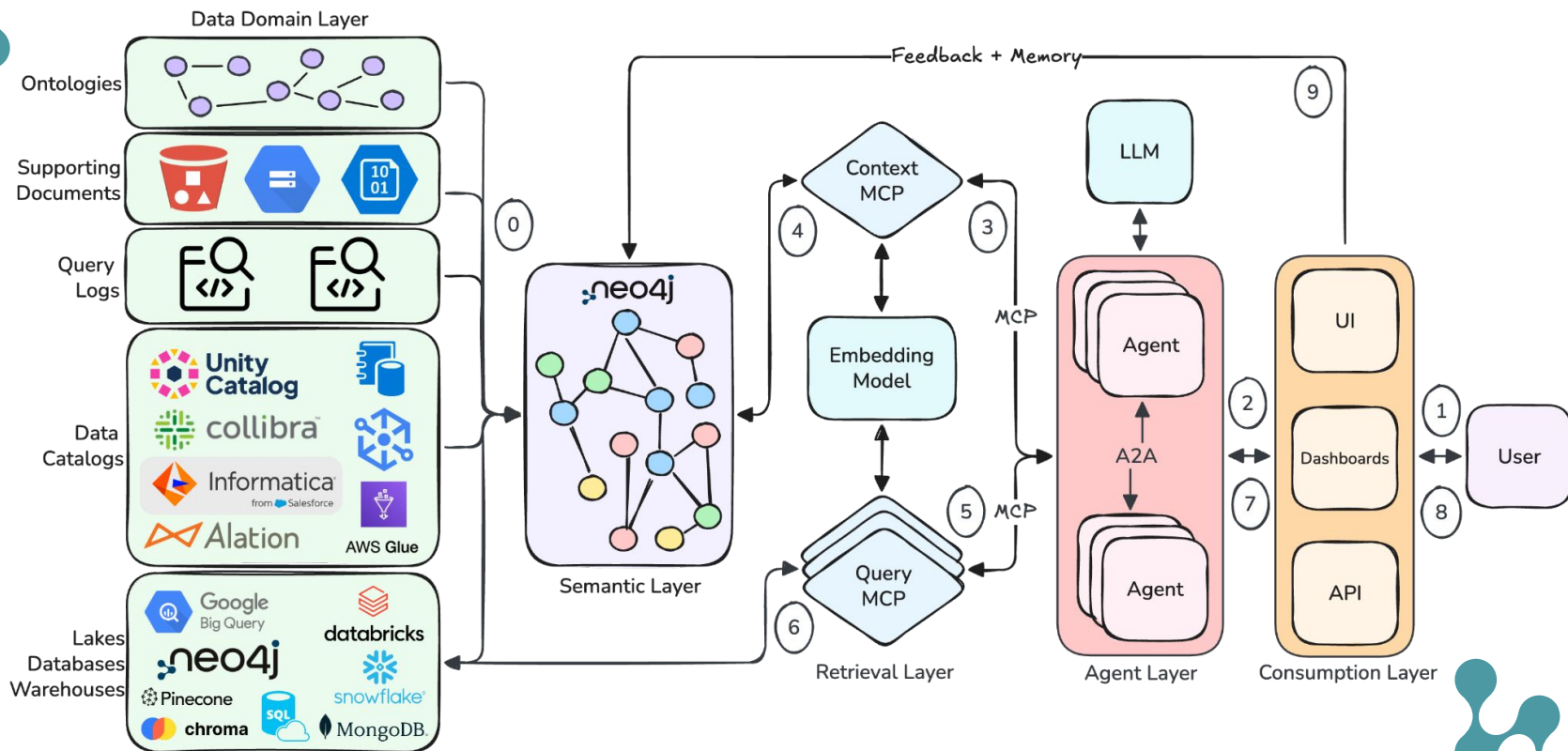


LAYER 2 - Data products



LAYER 1 - Technical assets







Benefits:

Knowledge sovereignty

Knowledge becomes a managed enterprise asset

Consistent and traceable agent behavior

More effective use of model context (token efficiency)

Centralised knowledge reuse: build once, use everywhere

Continuous improvement through learning and feedback



Move First, Move Fast, Move Well



Execution

Advantage

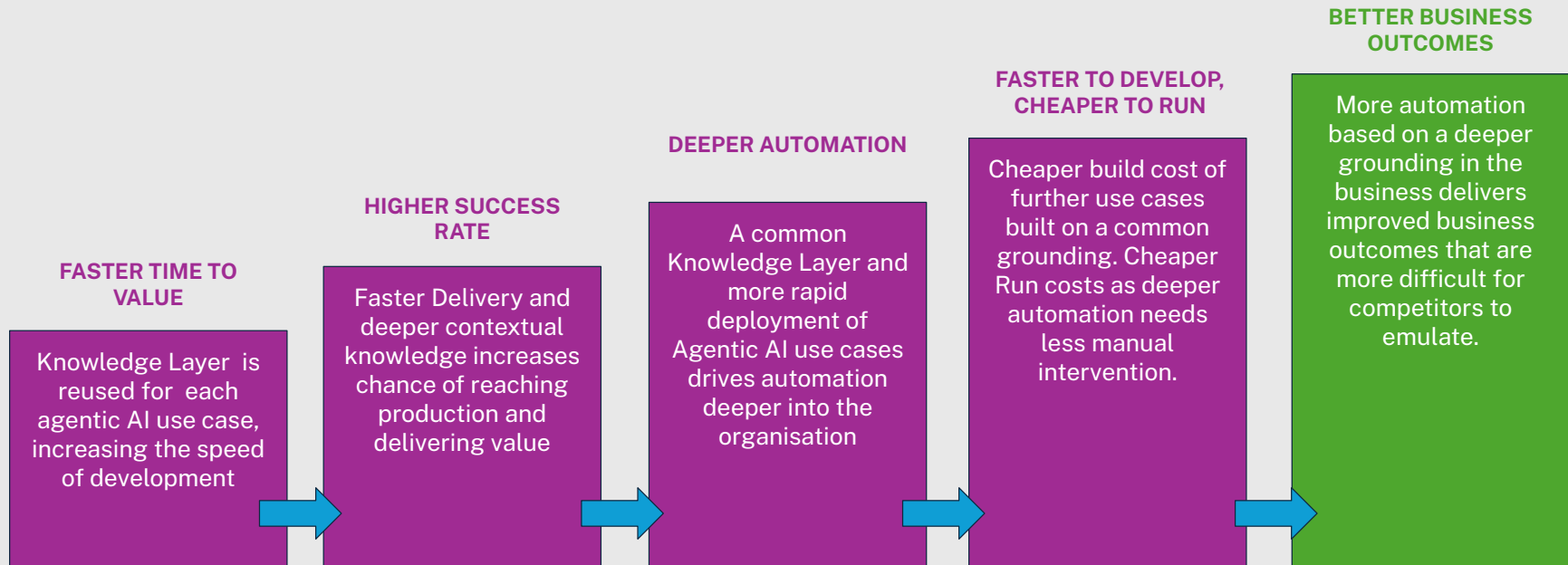
Durability

Knowledge-grounded
Business

Proprietary, Specific,
Fresh

Enhanced by
Observation &
Experience

The Knowledge Layer cascades value



Faster delivery of Agentic AI on the Neo4j Knowledge Layer delivers a cascade of compounding benefits

Neo4j Knowledge Layer gives your Agentic AI a complete, traversable, extensible map of your organization and how it operates



One
Network

Within a graph all elements of the knowledge layer are connected – as they are in the real world.

Extensible

As your business changes and grows, the Knowledge Layer will extend and enrich to match and capture its differentiation.

Context
Rich

Agents quickly and easily pull precisely the context and the data the task requires.

Trusted

Trace-ability and auditability comes as standard with Neo4j.



Levels of Benefit from Neo4j Knowledge Layer

Agentic Use Cases

Enables Competitive Advantage & Efficiency Gains from successful rollout of Agentic AI

Knowledge Layer Foundation

Each subsequent Agent builds on the existing elements of the Enterprise Knowledge Layer

Neo4j Graph Platform

A connected, extensible, context-rich, trusted map for AI Agents

Connecting AI agents to enterprise knowledge



Trust in AI

**Transparent
Decision-Making**

**Unlocking Scale
& Efficiency**

“Connectivity, ontologies, and knowledge maps must be adaptable to the changing environment. Gone are the days of static tables and reports as decision foundations.

AI and knowledge maps help build that adaptability.

Investing time getting that foundation right is a very important step.”

Jim Jacob, Cummins

NEW MIT RESEARCH

Why most AI agent projects never reach production

Only 34% make it. See what the top 13% of organizations do differently.



Read the report

MIT
Technology
Review
Insights

Produced in partnership with
neo4j Graph Intelligence
Platform

A strong structural foundation
that links data and agents is key
for context-rich agentic AI that
scales.

Connecting AI agents to enterprise knowledge



DELIVER ON AI

New research: Enterprises see 230% ROI with Neo4j

Improved AI reasoning and more powerful
analytics yield \$4M annual benefit



Read the business value snapshot

IDC White Paper, sponsored by Neo4j, The Business Value of the Neo4j Graph Intelligence Platform,
Doc #US54319826, May 2026.



May 2026
Business Value Snapshot
Sponsored by Neo4j

The Business Value of the Neo4j Graph Intelligence Platform

 Devin Pratt Megan Scurley

Interviewed organizations reported **performance and decision-making benefits** from Neo4j, a graph database platform used to manage and analyze **highly connected data** for **context-aware and AI-driven applications**. Customers reported **higher revenue, improved customer satisfaction, faster development cycles, and greater operational efficiency** — alongside substantial IT and cost optimization gains. IDC calculated that interviewed organizations achieved benefits worth an **annual average of \$4 million** which resulted in a **three-year ROI of 230%**.

Key Results

\$4 million average annual benefits	230% three-year return on investment	7.8-month payback on investment
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Customer Quote (Life Sciences):
"Neo4j has increasingly become a core data backbone for our GenAI initiatives by providing structured and explainable context for models. Also, using Neo4j has reduced LLM hallucination rates from roughly 20–40% down to about 2–5%."

Business Benefits

→ \$1,010,573 total additional net revenue per organization → 38% improvement in transaction rates → 53% quicker queries → 28% more productive development teams → 43% quicker response times → 31% improvement in overall model performance	Customer Quote (Technology): "My company has definitely been increasing our revenue with Neo4j, and it is forecasted to grow further. Currently, we have gained around \$4 million with Neo4j." Customer Quote (Life Sciences): "Scaling is now effectively exponential compared to traditional databases, with much higher performance as the number of nodes and relationships grows. We can answer complex questions far faster, seeing up to 100 times query improvements on large discovery datasets and five to six times faster queries on smaller production systems."
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Read the full white paper →

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An aerial photograph of a dense, lush green forest serves as the background. The image is decorated with abstract shapes: a large, wavy orange shape in the top right corner, a green shape in the bottom left corner, and a green logo-like shape in the bottom right corner. The text "Thank you!" is centered in a white, sans-serif font.

Thank you!