Power of Graph XAI

An Unusual Case Study on GPU vs. CPU on Performance + Cost + ESG

https://www.ultipa.com

Ricky@Ultipa.com

The Dilemma 4 Data Analytics Products

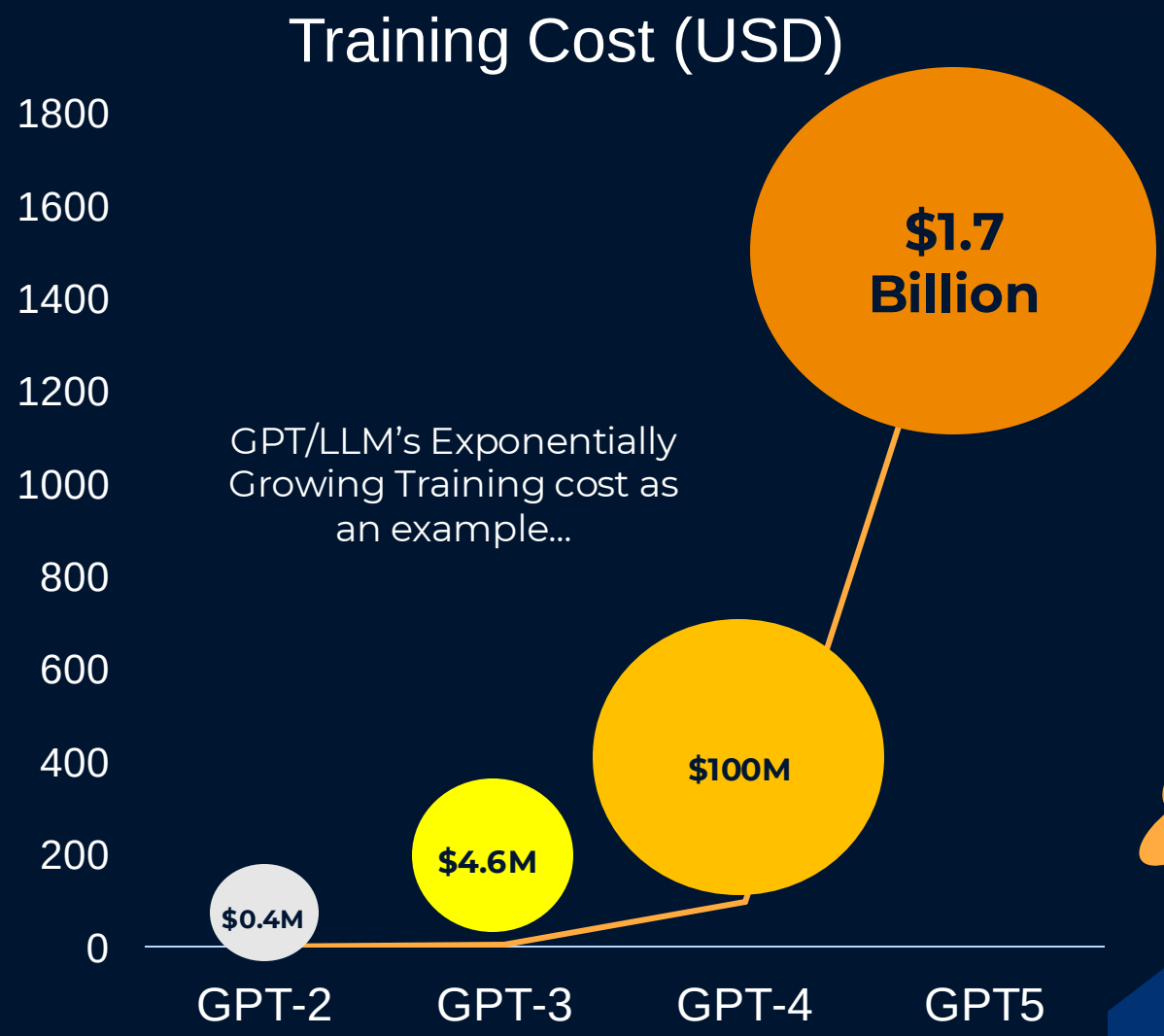
Strategic Planning Assumption:

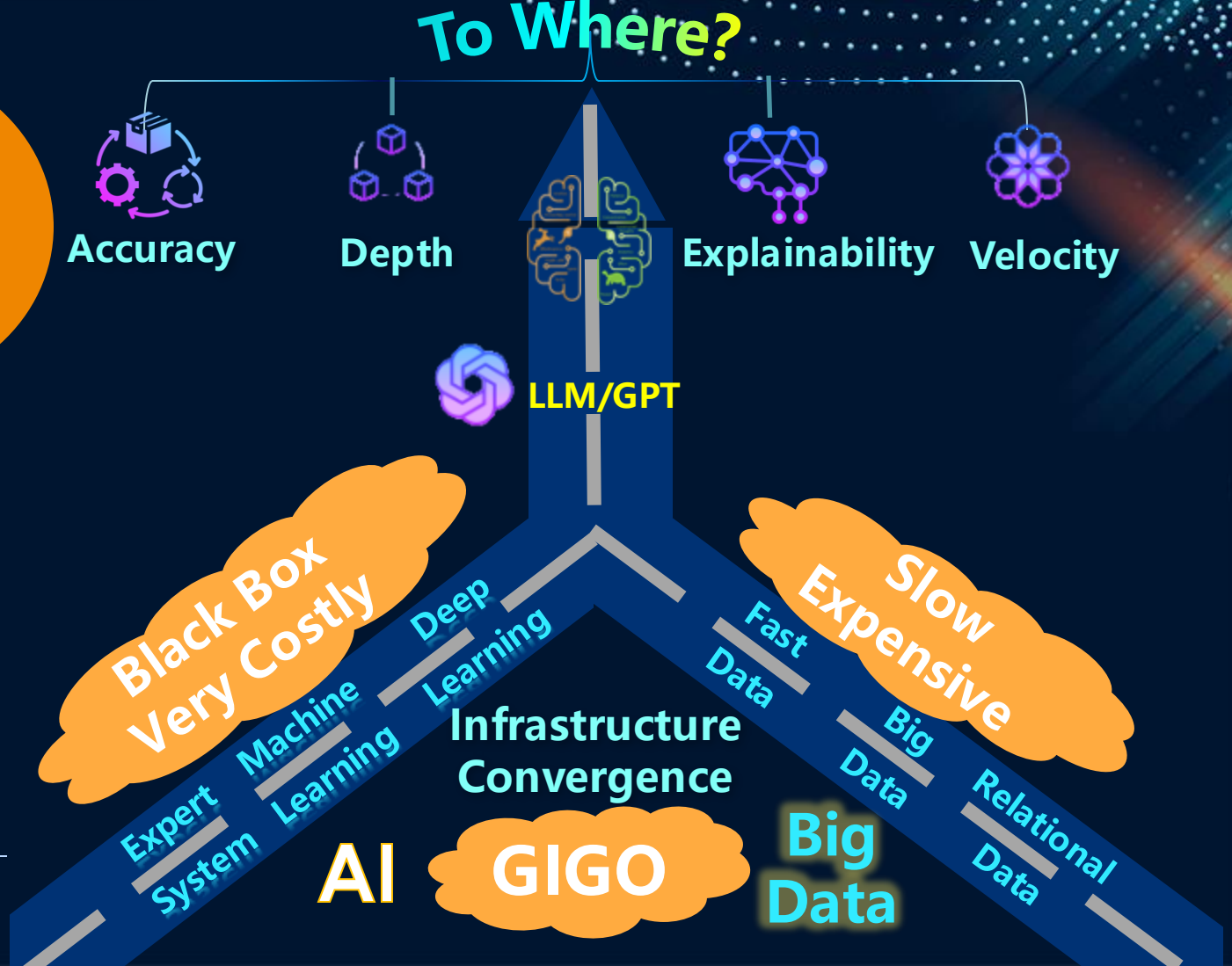
By 2027, 75% of data, digital or analytics products will be made redundant, or marketplaces shut down, as too few “customers” came to use them.

Gartner

The AI Entropy Challenge

Black-Box | BIAS | LOW-SPEED | HIGH COSTS | ETHICAL CONCERN | UNPREDICTABILITY

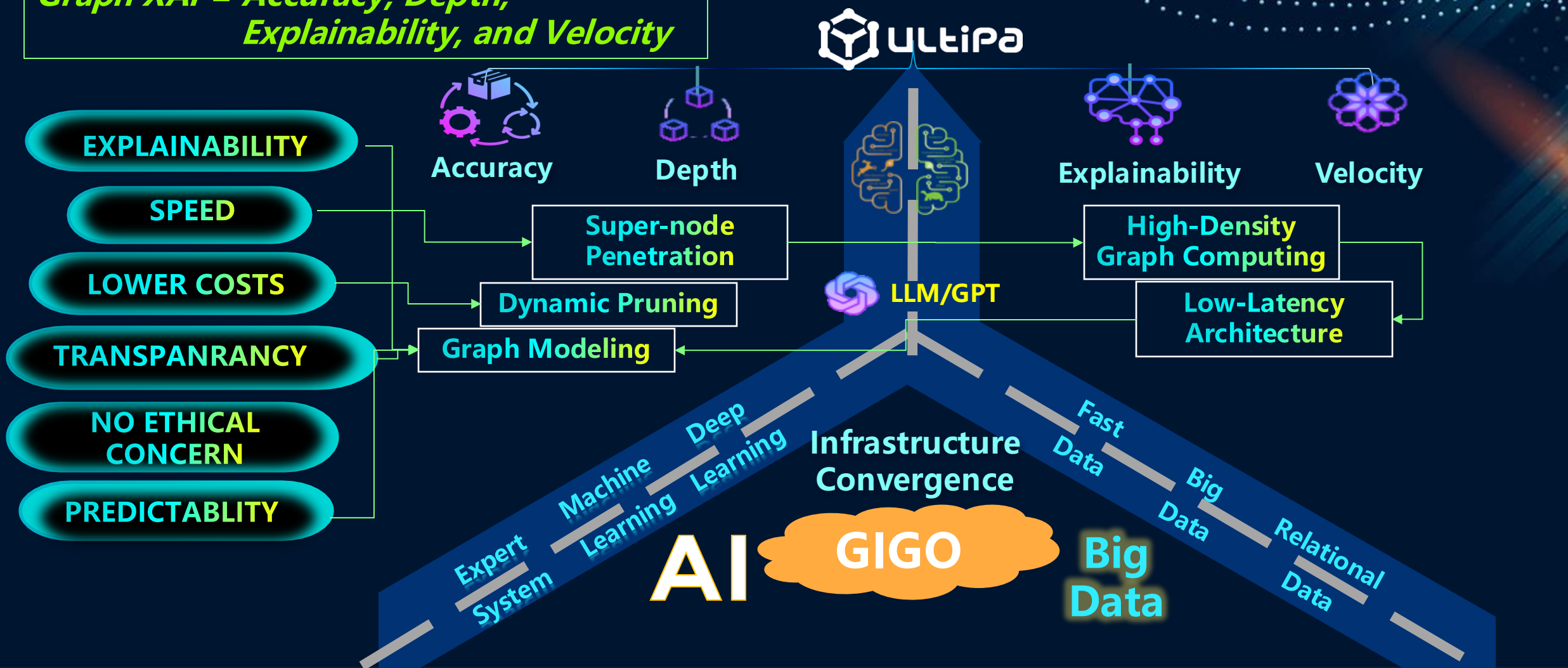




Simplifying AI with Ultipa Graph XAI

Cost-Saving: ~70% | **Energy-Saving: ~75%** | **Speed-Up: ~10x**

Graph XAI = Accuracy, Depth, Explainability, and Velocity



Anti-Entropy w/ Graph XAI

Extremely Energy-efficient Architecture, Data-Modeling, Algorithms, and Queries…

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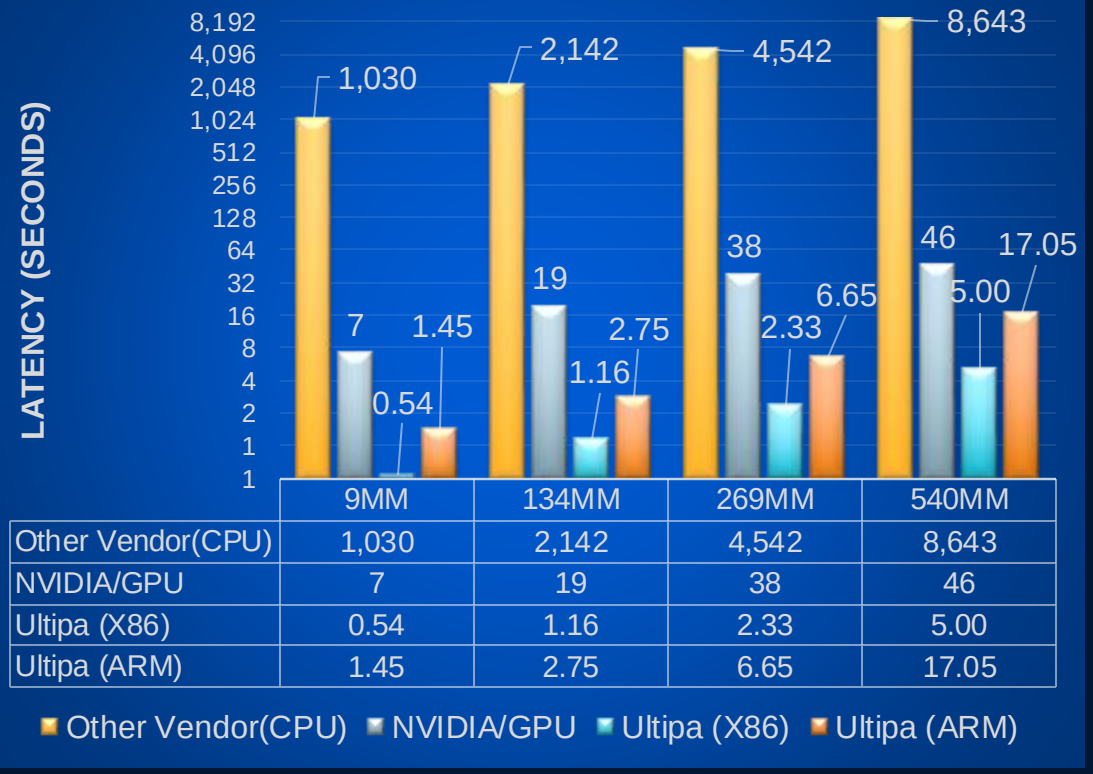
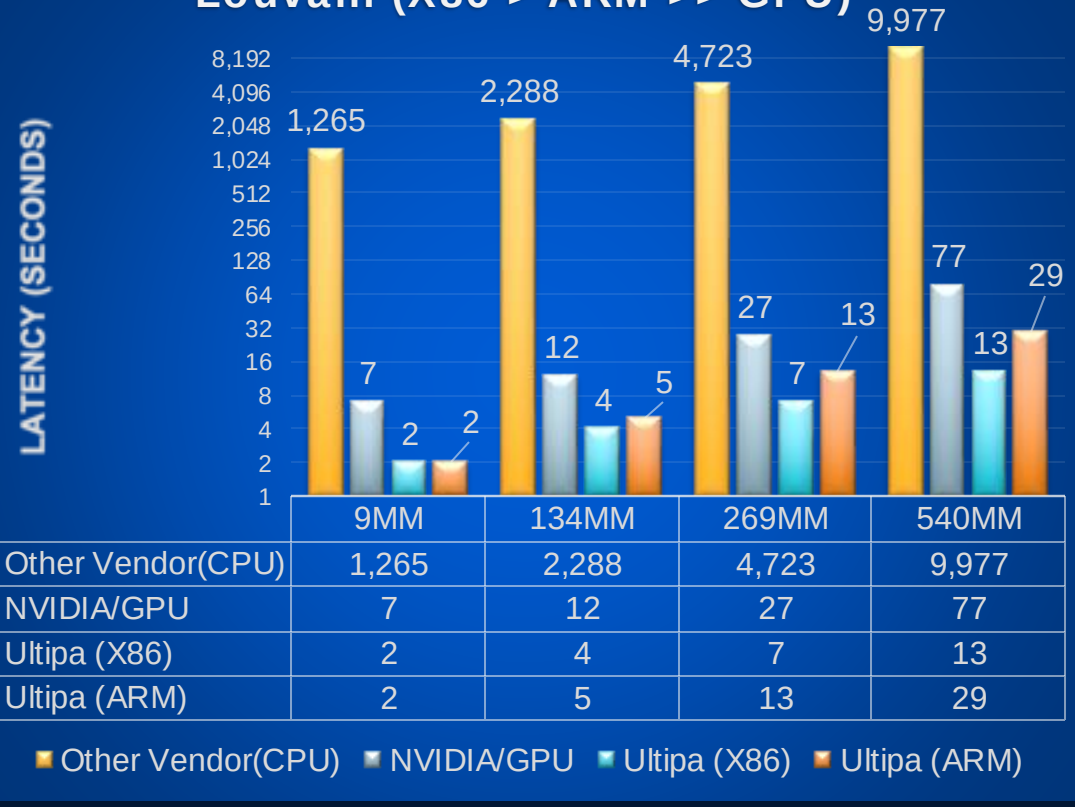
PageRank (X86 > ARM >>GPU)



	9MM	134MM	269MM	540MM
Other Vendor(CPU)	1,030	2,142	4,542	8,643
NVIDIA/GPU	7	19	38	46
Ultipa (X86)	0.54	1.16	2.33	5.00
Ultipa (ARM)	1.45	2.75	6.65	17.05

Ultipa's speed-up over TG's GPU: 1,370% (13.7x)
Ultipa's speed-up over TG's CPU: 185,800% (1858x)

Louvain (X86 > ARM >> GPU)



	9MM	134MM	269MM	540MM
Other Vendor(CPU)	1,265	2,288	4,723	9,977
NVIDIA/GPU	7	12	27	77
Ultipa (X86)	2	4	7	13
Ultipa (ARM)	2	5	13	29

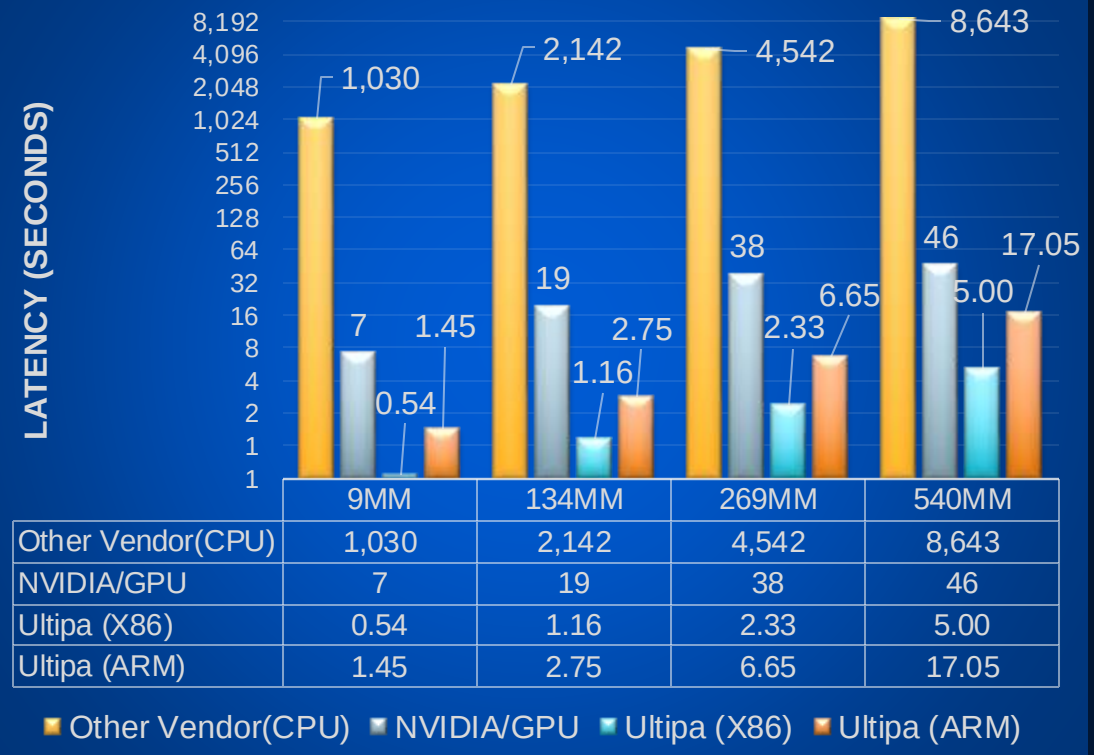
Ultipa's speed-up over TG's GPU: 410%
Ultipa's speed-up over TG's CPU: 66,200%

Making AI Smarter and Leaner

Extremely Energy-efficient Architecture, Data-Modeling, Algorithms, and Queries…

Cost-Saving: ~70% | **Energy-Saving: ~75%** | **Speed-Up: ~10x**

Algo Performance (X86 > ARM >>GPU)



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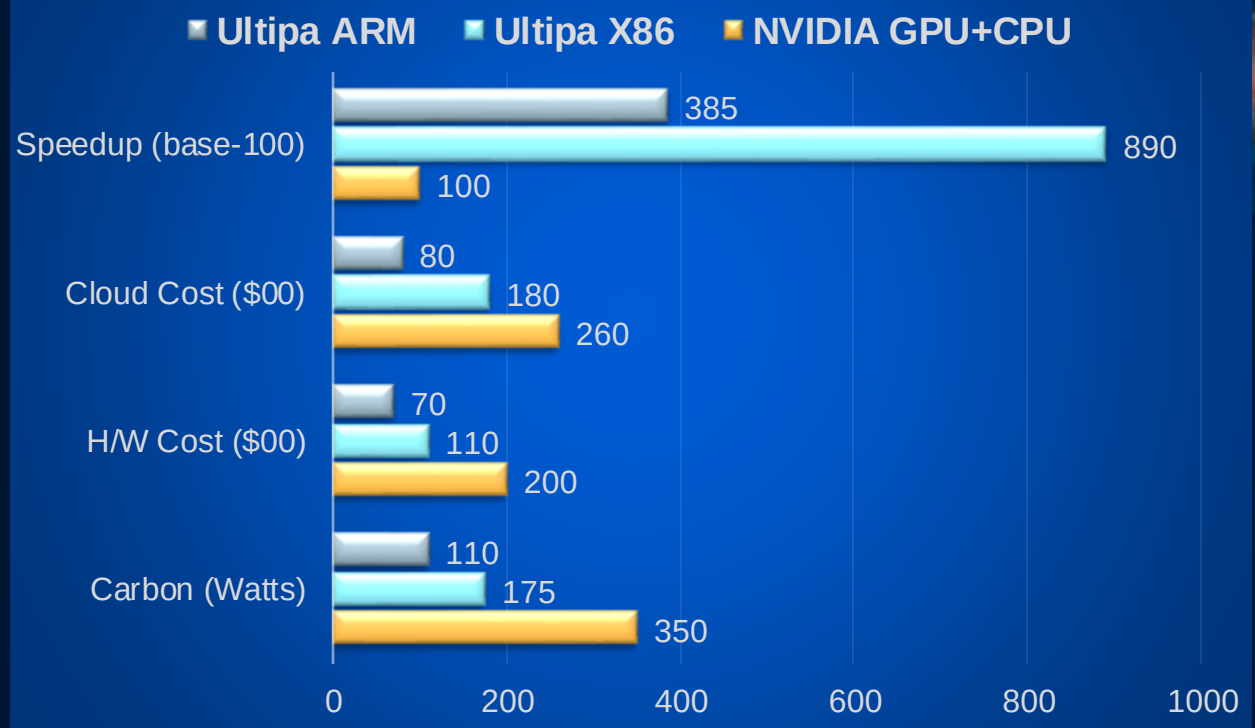
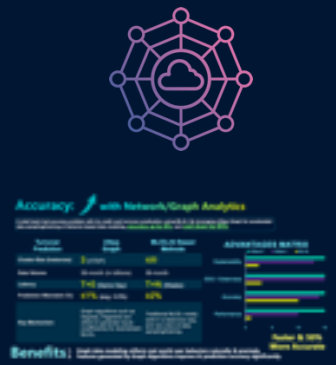
ESG/Carbon-Footprint & Costs



Ultipa's Cost-Saving NVIDIA GPU: 70%
Ultipa's Carbon Footprint savings: 75%

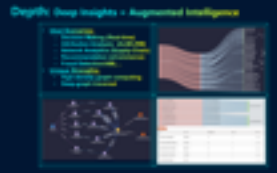
Ultipa Graph XAI: The MAGIC CURE w/ Showcases

70% Reduction on Cost, Energy-Use, Time-to-Market w/ A-D-E-V



ACCURACY

Lower mismatch ratio by 50%, and improve prediction accuracy with simplified process

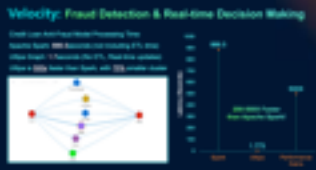


DEPTH

Deeper insights with real-time, deep and recursive network analytics

EXPLAINABILITY

White-box explainability achieved w/ real-time graph computing



VELOCITY

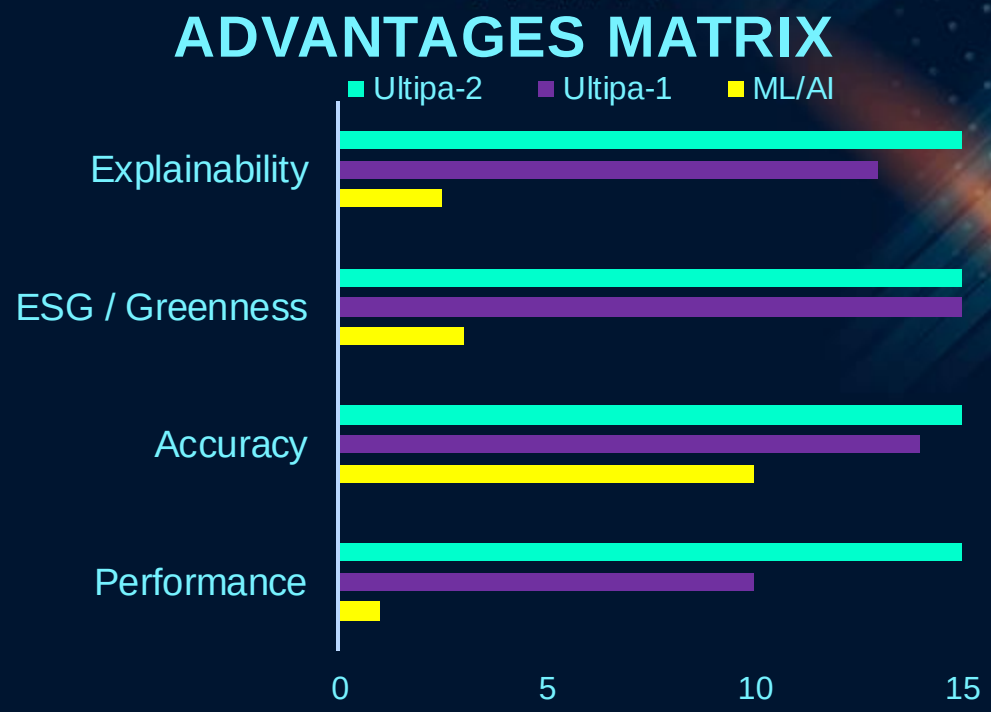
10-1,000x+ faster than tradition analytics infrastructures

*"**Ultipa** boldly positions itself as a pioneering **XAI** company, defying the AI-entropy problem w/ magical returns on better Accuracy-Depth-Explainability-Velocity, Lower TCO and Faster TTM."*

Accuracy: with Network/Graph Analytics

A retail bank had accuracy problem with its credit card turnover predication using ML/AI. By leveraging Ultipa Graph for accelerated data sampling/training w/ behavior-based data modeling, accuracy up by 50%, and cost down by 80%!

Turnover Prediction	Ultipa Graph	ML/DL/AI Based Methods
Cluster-Size (Instances)	3 (HTAP)	≥20
Data Volume	36-month (in billions)	36-month
Latency	T+0 (Same Day)	T+N (Weeks)
Prediction Mismatch (%)	≤1% (avg. 0.5%)	≥2%
Key Mechanism	Graph algorithms such as Degrees, Pagerank and others to generate inputs (coefficients) for downstream ML/DL.	Traditional ML/DL mostly work in a black-box way, and very slow at data-sampling/training.



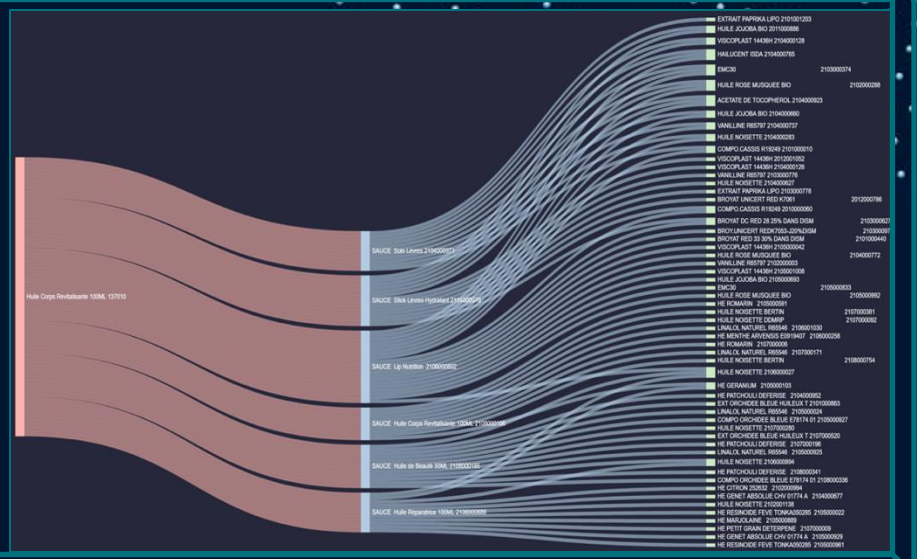
Faster & 50% More Accurate

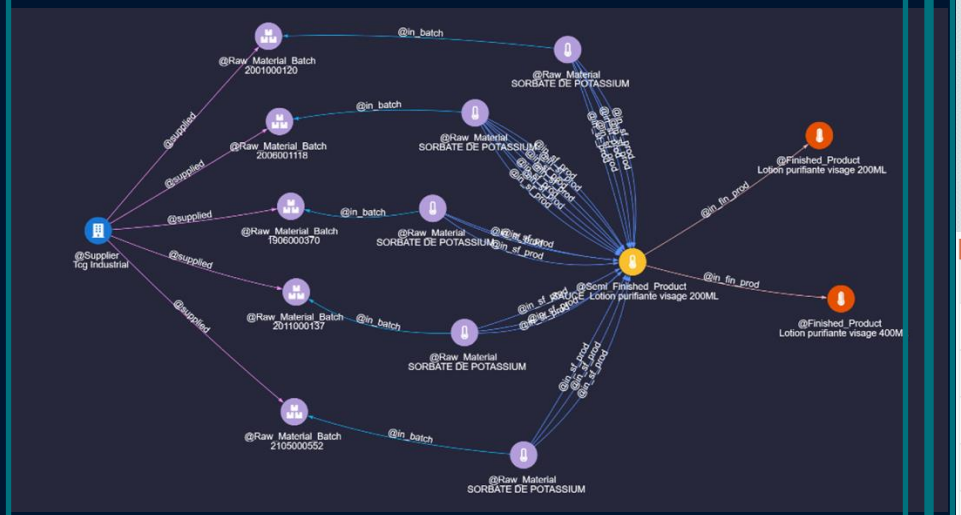
Benefits

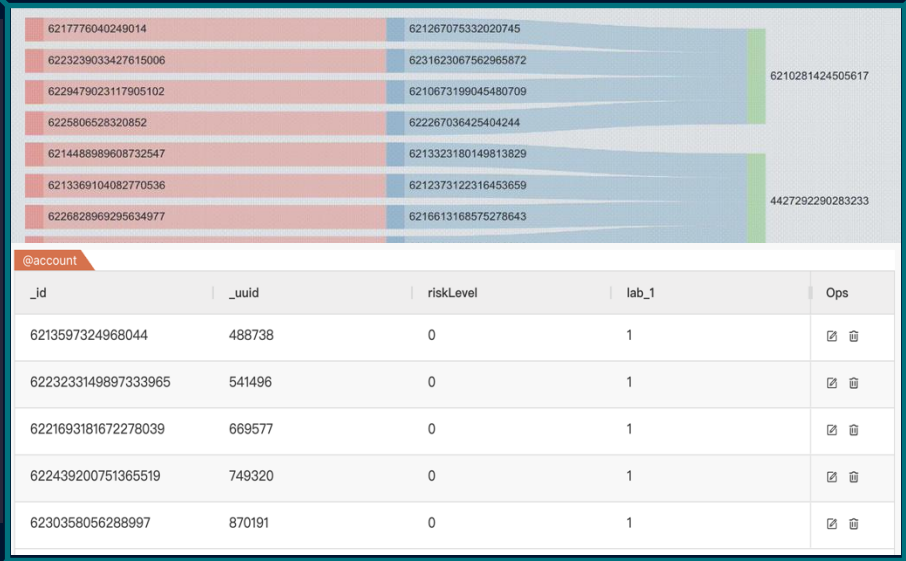
1. Graph data modeling reflects real-world user behaviors naturally & precisely.
2. Features generated by Graph Algorithms improve AI prediction accuracy significantly.

Depth: Deep Insights = Augmented Intelligence

- **Ideal Scenarios:**
  - Decision Making (Real-time)
  - Attribution Analysis (ALM/LRM)
  - Network Analytics (Supply-Chain)
  - Recommendation (eCommerce)
  - Fraud Detection/AML…
- **Unique Strengths:**
  - High-density graph computing
  - Deep-graph traversal

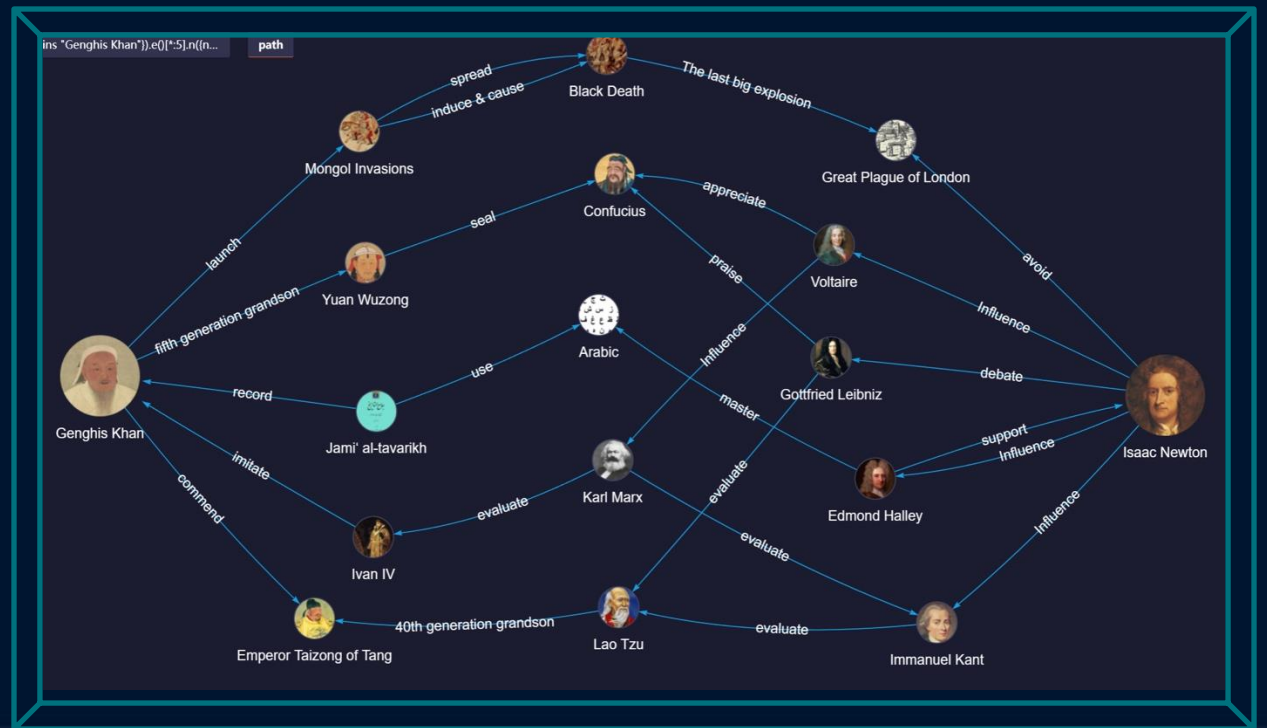


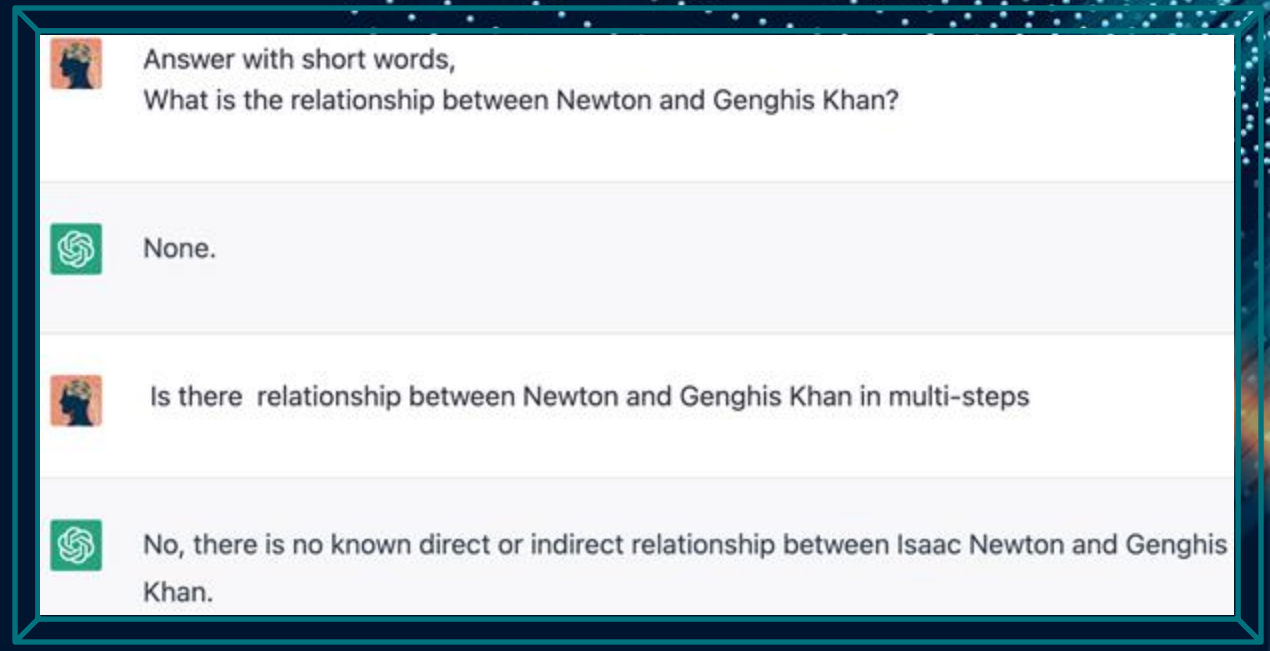




Explainability: White-box Deep Traversal

- x LLM cannot handle deep queries
- x LLM is basically a black-box
- x LLM cannot update in real-time





- ✓ Ultipa graph is deep-query capable
- ✓ White-box explainable
- ✓ Updated in real-time

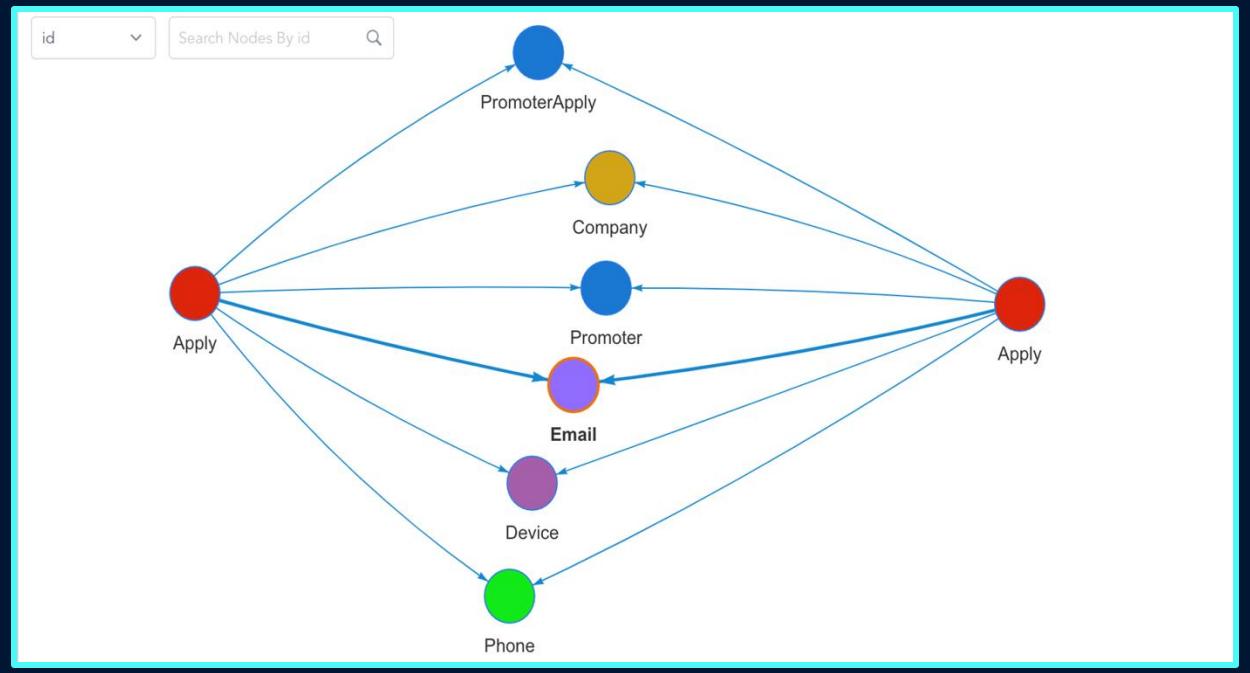
Velocity: Fraud Detection & Real-time Decision Making

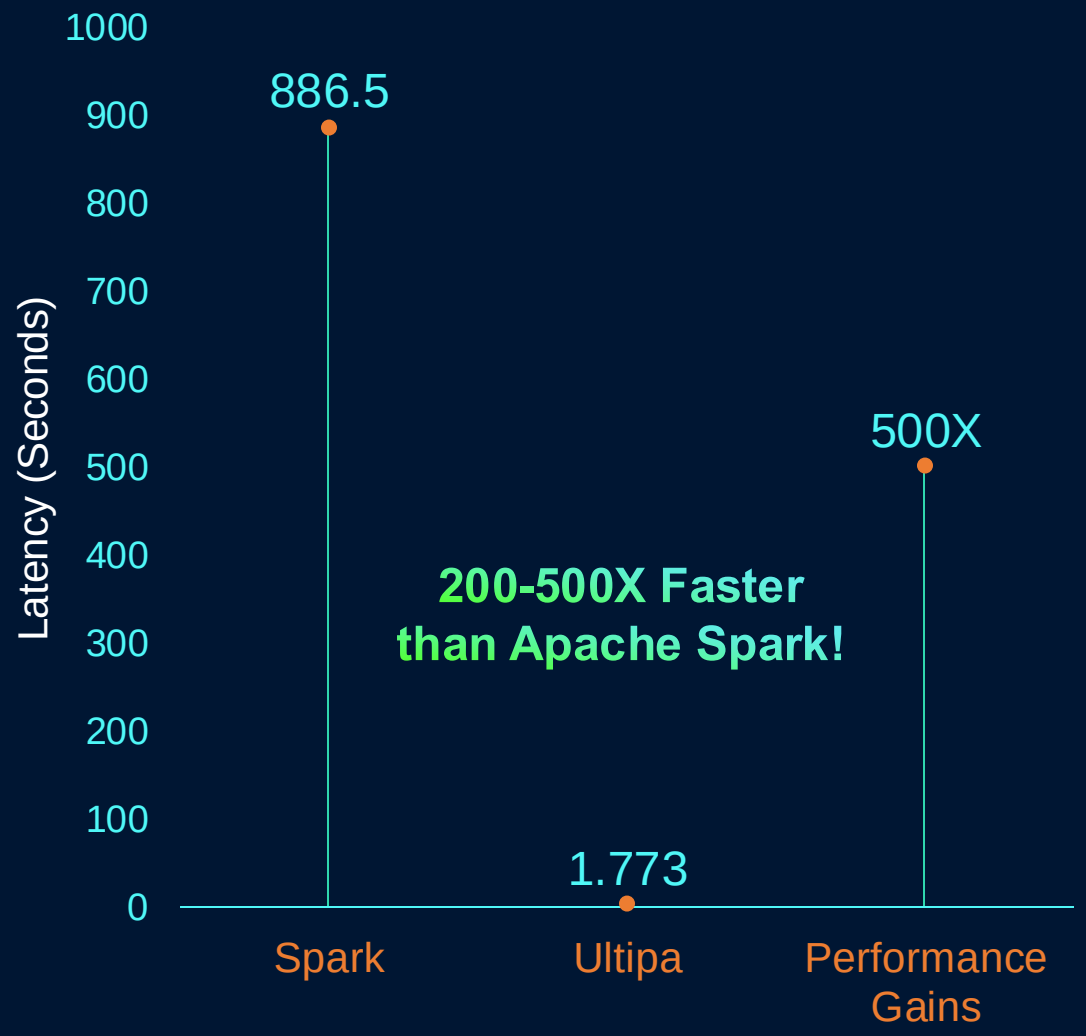
Credit Loan Anti-Fraud Model Processing Time:

Apache Spark: 886.5seconds (not including ETL time)

Ultipa Graph: 1.7seconds (No ETL, Real-time updates)

Ultipa is 500x faster than Spark, with 75% smaller cluster





Velocity: Attribution Analysis -- Liquidity Risk Management

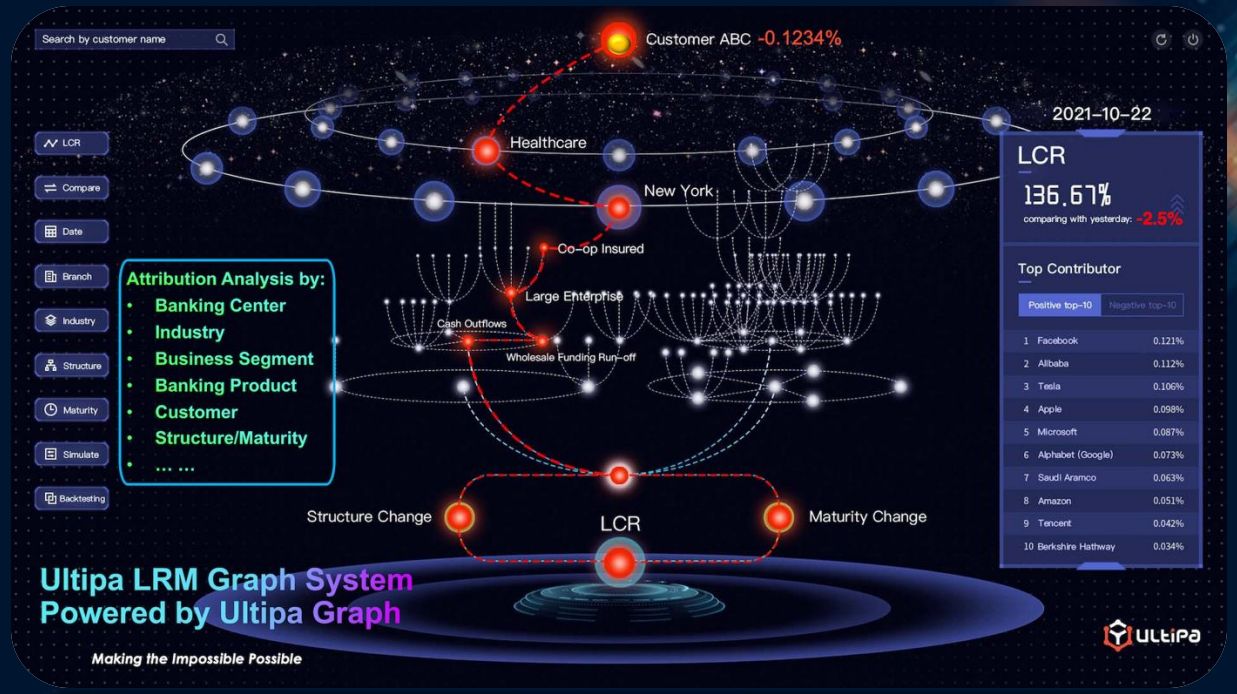
Ultipa Graph powered liquidity management and ALM turns risks into opportunities.

It's exponentially faster, more robust, accurate, white-box explainable, 90% lower in TCO!

300 Million Transactions/Day

Comparison	Oracle	Ultipa
Latency	12,600 Seconds	2 Seconds
Attribution Analysis?	N/A Too Slow	Yes Real-time
White-Box	No	Yes
Visualization	No	Yes 3D
TCO (Cost)	180 Man-Month 45K SQL	18 Man-Month 2K GQL
System Stability	Weekly Glitches	Sound & Stable

Regulatory Requirements: Daily Report ...

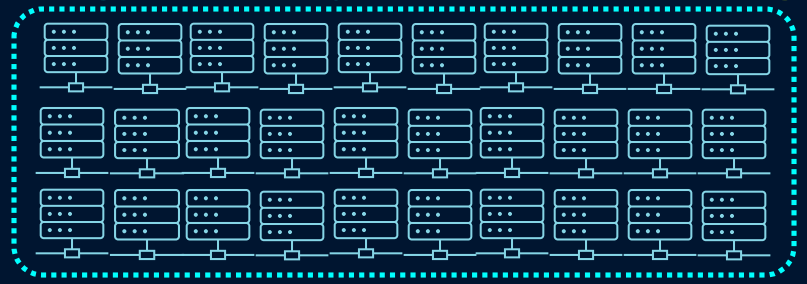


Confidential

Ultipa XAI's Innovation & Benefits

Greener Computing, Lower Carbon Footprint, Network & Deep Data Analytics

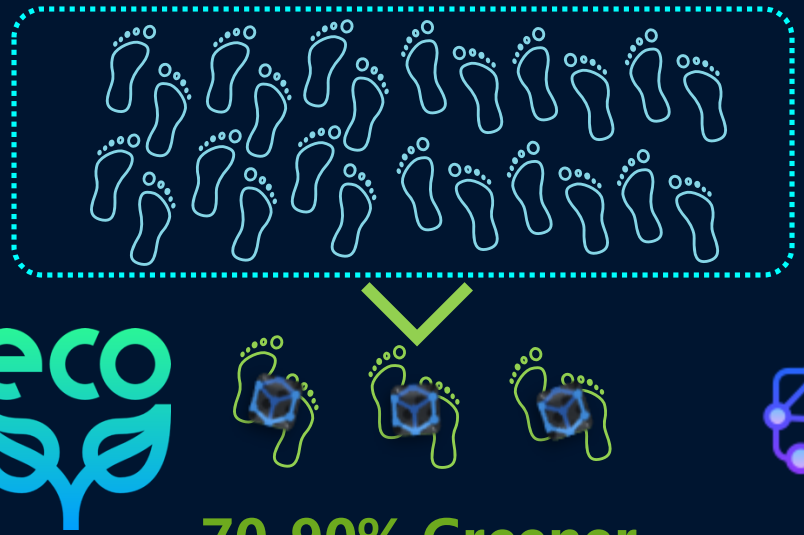
High-Density Graph Computing



10,000X Faster

- **10X+** More Effective HW Utilization
- **10X+** Denser Parallel Computing
- **70%+** Smaller Cluster Size
- **70%** Lower Total Cost of Ownership
- **10-10,000x** Faster

Smaller Carbon Footprint



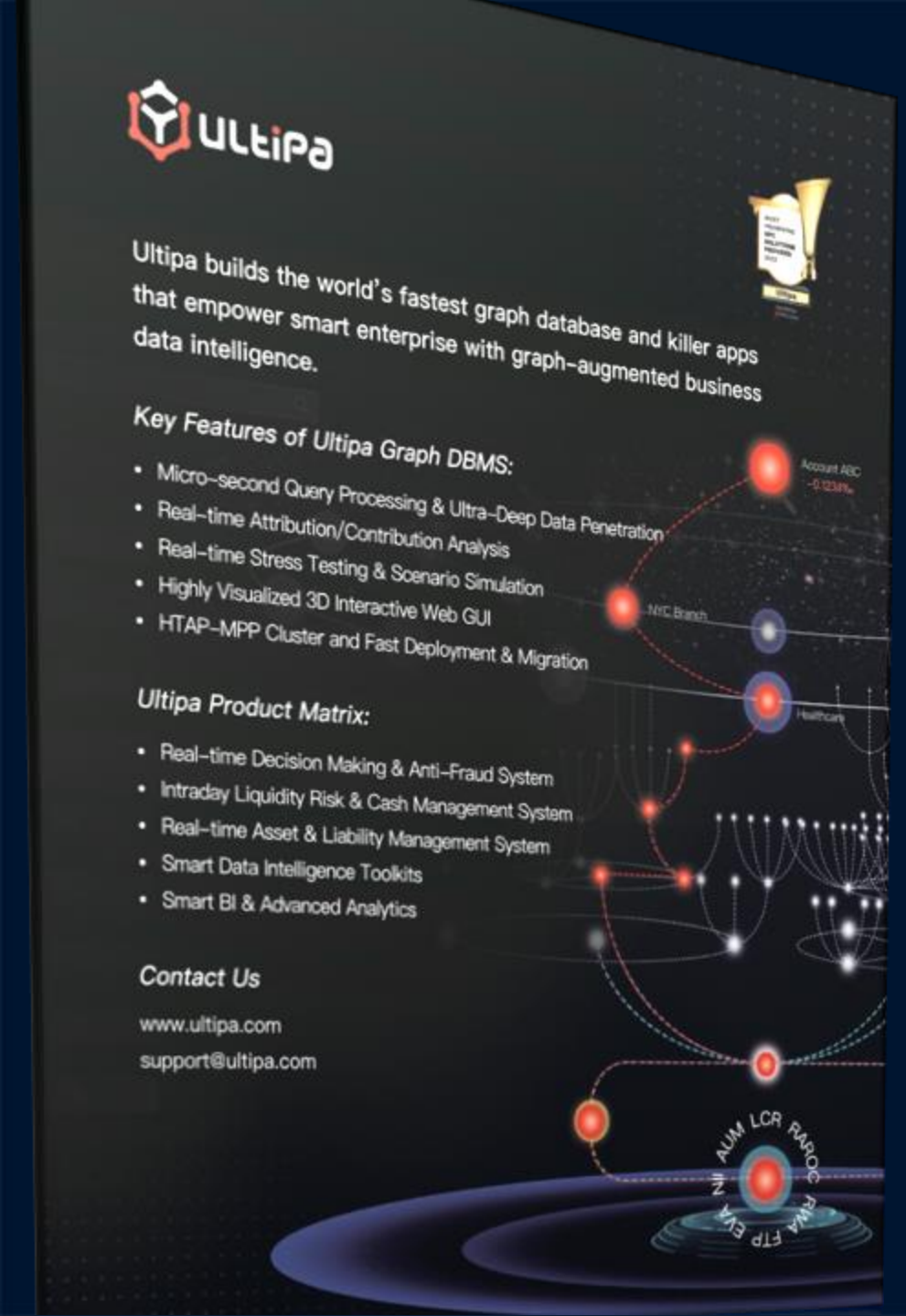
70-90% Greener

- **70%+** Smaller Cluster Size
- **70%** Lower Carbon Emission
- **70%** Lower TCO (up to 90%)
- Great ROI
- Fast Track to Carbon Neutrality

Next-gen Business Intelligence

XAI

- **Productivity + Trust + Regulation**
- **A**ccurate Calculation & Prediction
- **D**eep Data Mining
- **Explainable AI (XAI)**
- **V**elocity (speed-up by 100X plus)



Graph Power Play

Graph to Connect Everything
Penetrate Everything
Quantify Everything

Agility & Capability

Graph Augmented AI/ML
White-box Explainable AI
100% Natural Data Modelling

Computing Power

Faster by 10-10,000x
100+ Algorithms
30-Hop Plus

Killer Apps

Data Intelligence Toolkits
Smart BI Applications
Real-time Decision Makings

Contact: *ricky@Ultipa.com*
Web: *https://www.ultipa.com*

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