

# Power of Graph XAI

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

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# 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

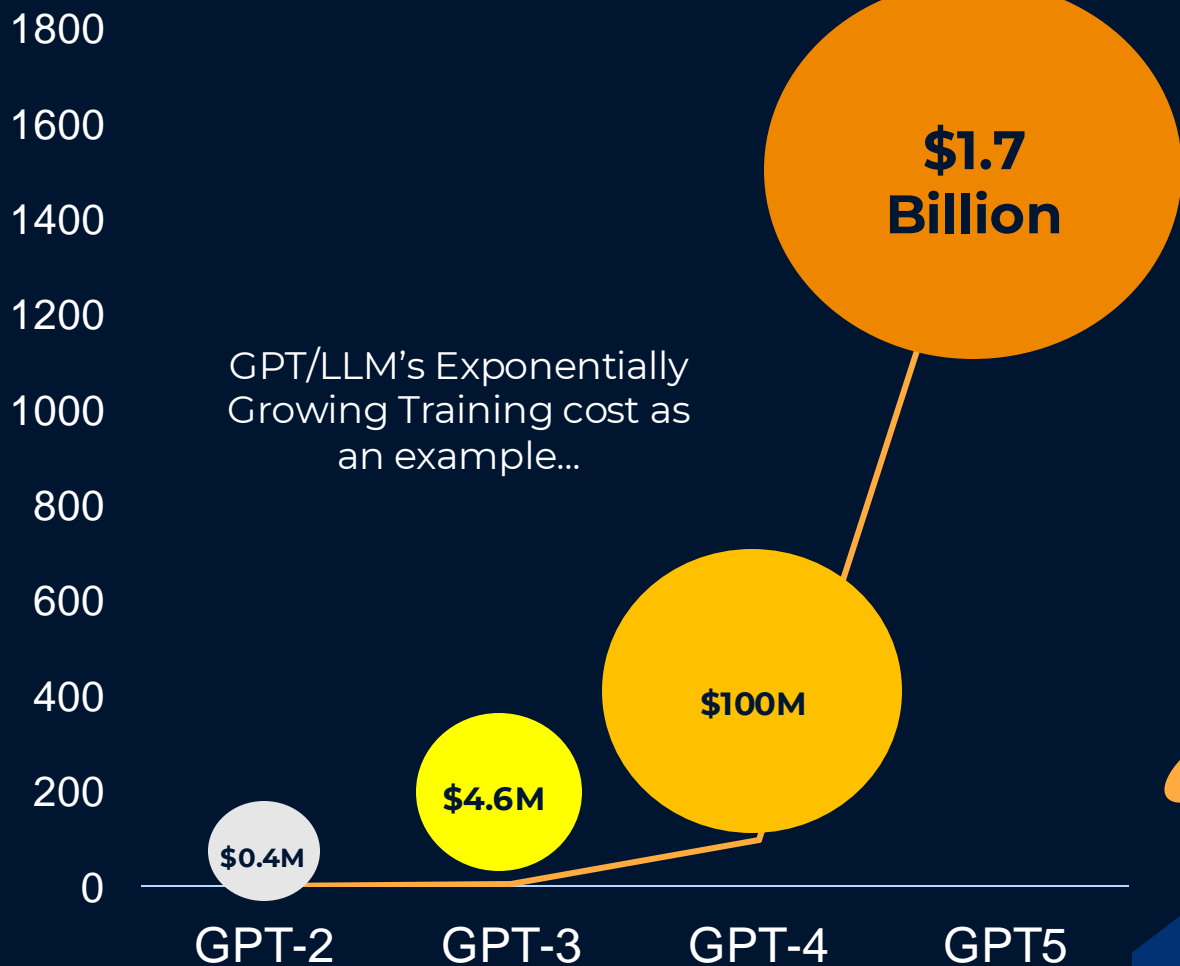
LOW-SPEED

HIGH COSTS

ETHICAL CONCERN

UNPREDICTABILITY

Training Cost (USD)



To Where?



Black Box  
Very Costly

Expert System  
Machine Learning  
Deep Learning

Infrastructure  
Convergence

AI

GIGO

Slow  
Expensive

Fast  
Data

Big  
Data  
Relational  
Data

Big  
Data

# Simplifying AI with Ultipa Graph XAI

Cost-Saving: ~70%

Energy-Saving: ~75%

Speed-Up: ~10x

*Graph XAI = Accuracy, Depth, Explainability, and Velocity*



Accuracy



Depth



Explainability



Velocity

EXPLAINABILITY

SPEED

LOWER COSTS

TRANSPARANCY

NO ETHICAL CONCERN

PREDICTABILITY

Super-node Penetration

Dynamic Pruning

Graph Modeling

High-Density Graph Computing

Low-Latency Architecture

LLM/GPT

Infrastructure Convergence

AI

GIGO

Big Data

Expert System

Machine Learning

Deep Learning

Fast Data

Big Data

Relational Data

# Anti-Entropy w/ Graph XAI

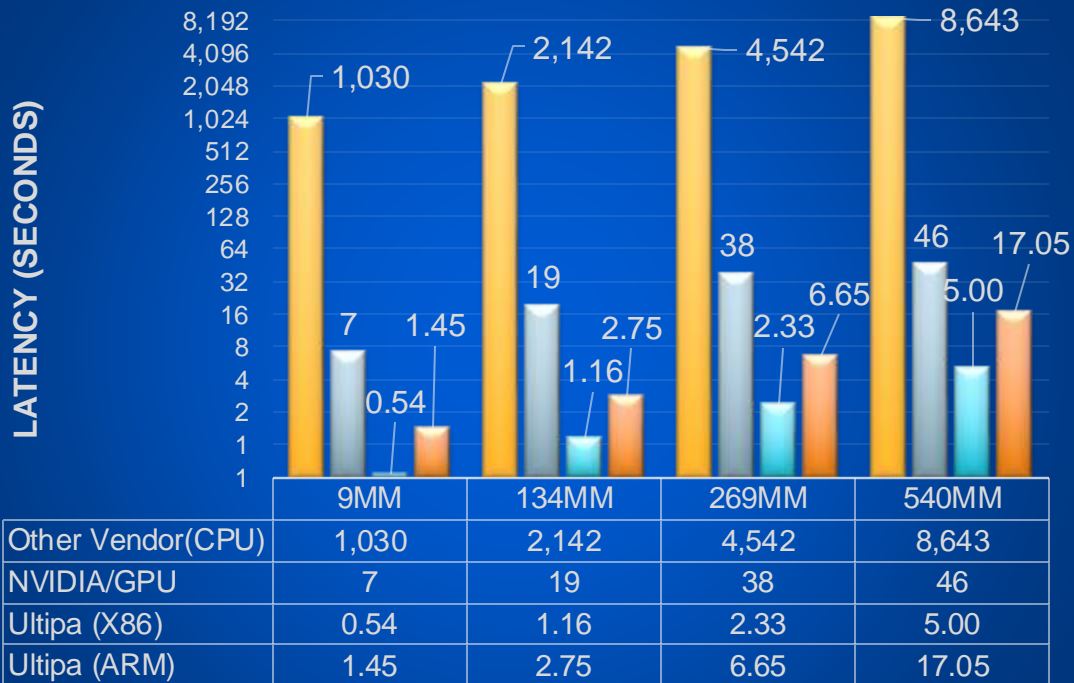
*Extremely Energy-efficient Architecture, Data-Modeling, Algorithms, and Queries...*

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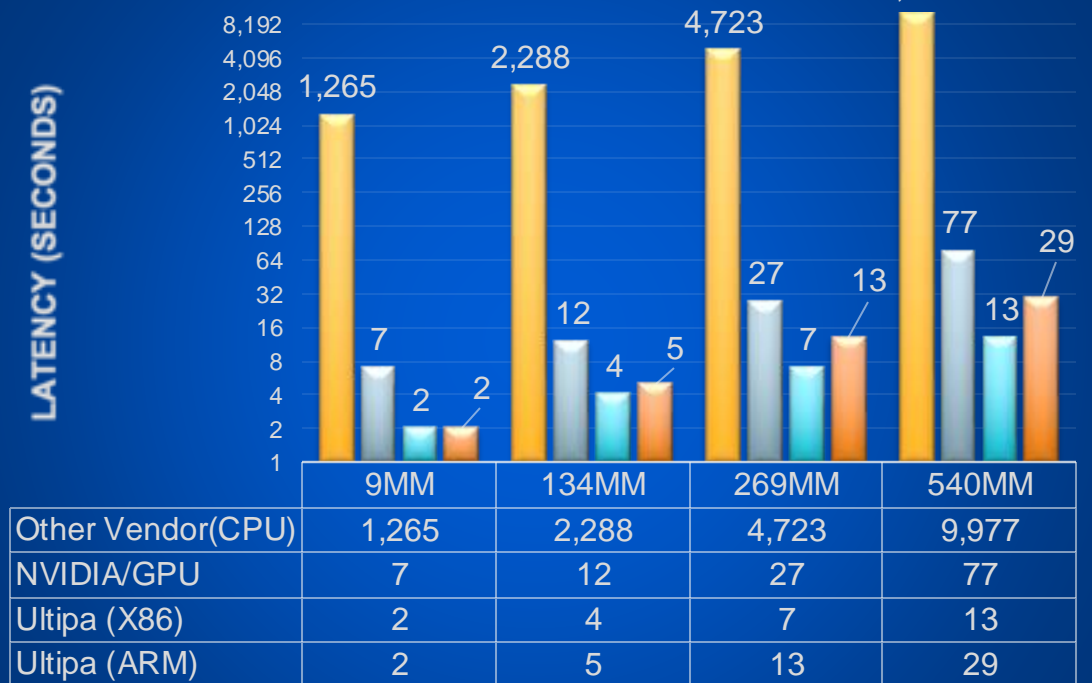
**PageRank (X86 > ARM >> GPU)**



■ Other Vendor(CPU) ■ NVIDIA/GPU ■ Ultipa (X86) ■ Ultipa (ARM)

**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)**



■ Other Vendor(CPU) ■ NVIDIA/GPU ■ Ultipa (X86) ■ Ultipa (ARM)

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

# Making AI Smarter and Leaner

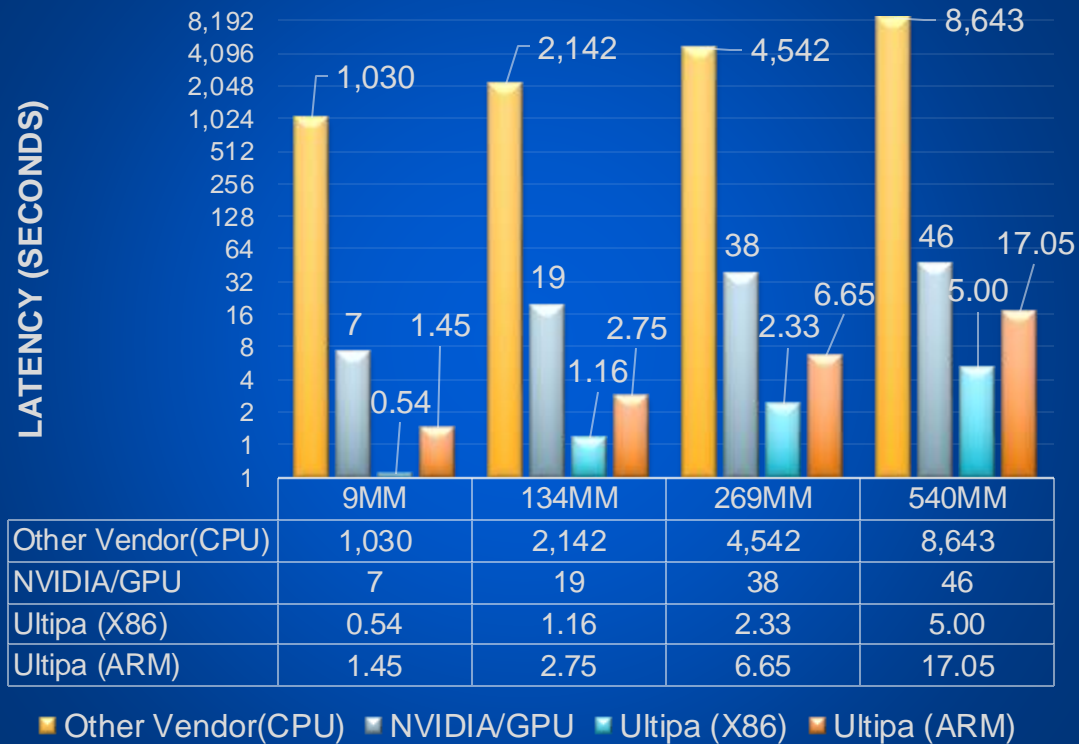
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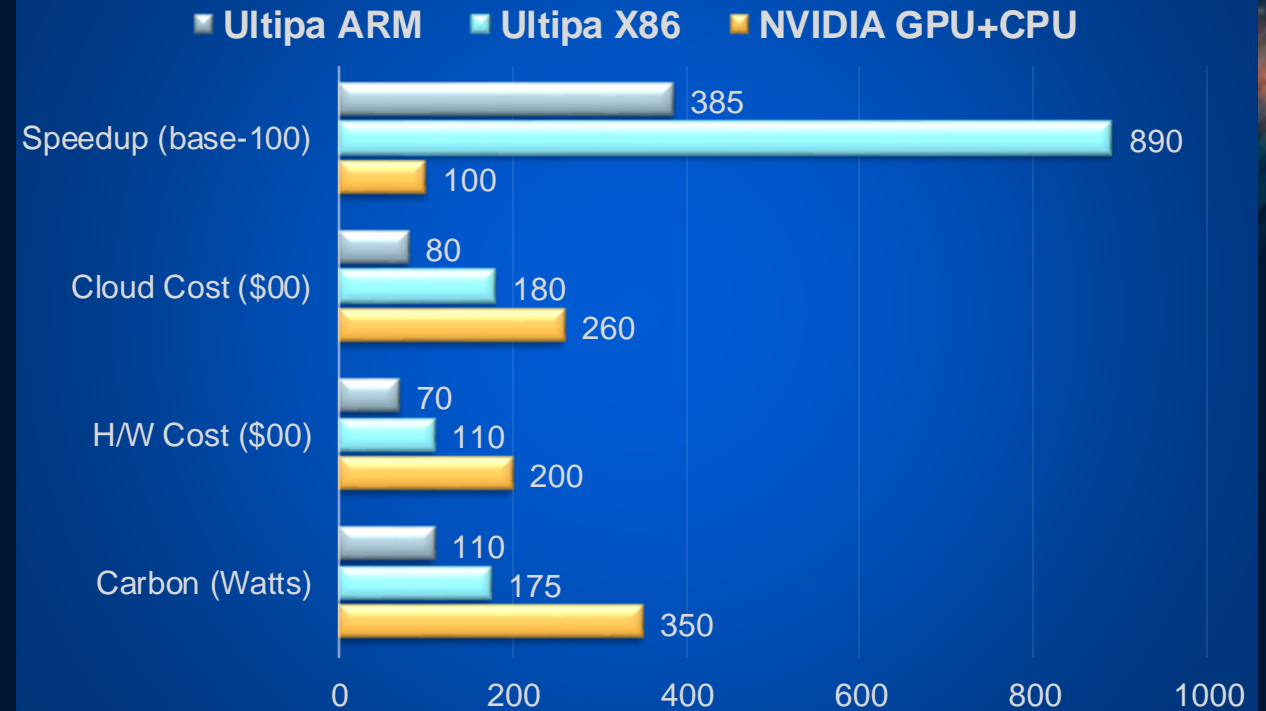
**Speed-Up: ~10x**

## Algo Performance (X86 > ARM >>GPU)



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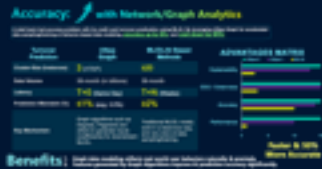
## ESG/Carbon-Footprint & Costs



**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

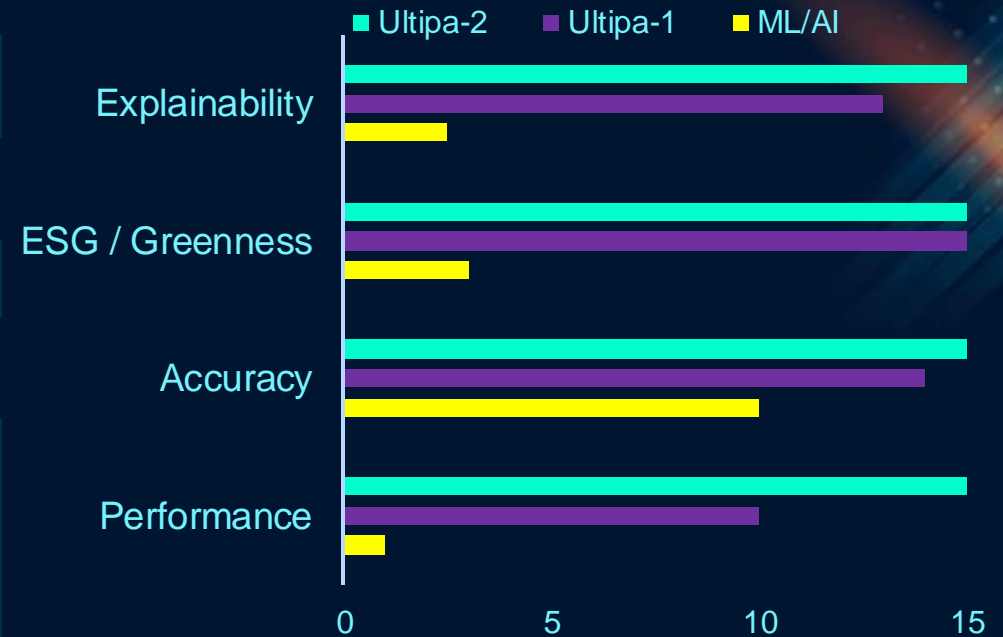
*“Ultipa boldly positions itself as a pioneering XAI company, defying the AI-entropy problem w/ magical returns on better Accuracy-Depth-Explainability-Velocity, Lower TCO and Faster TTM.”*

# 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.

## ADVANTAGES MATRIX



**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.



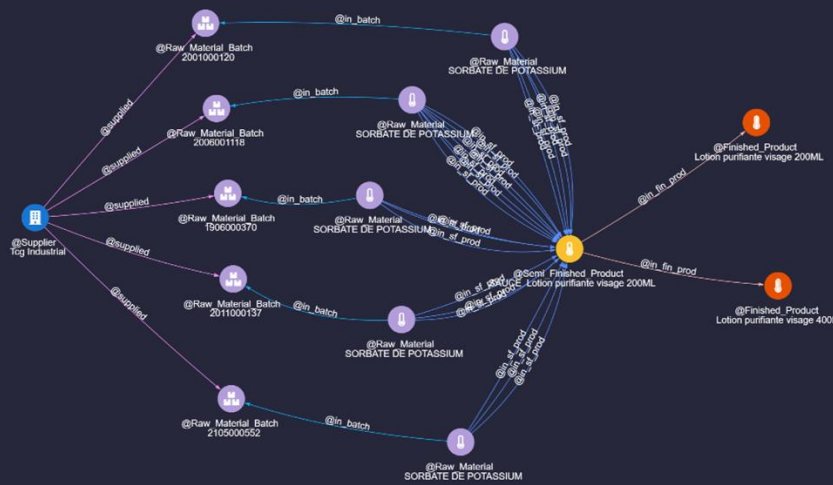
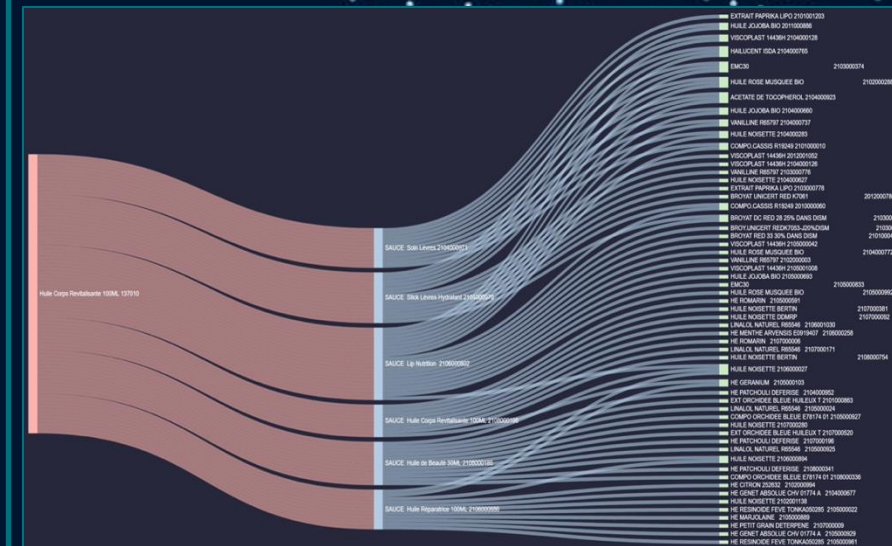
# Depth: Deep Insights = Augmented Intelligence

## 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



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# 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



Answer with short words,  
What is the relationship between Newton and Genghis Khan?



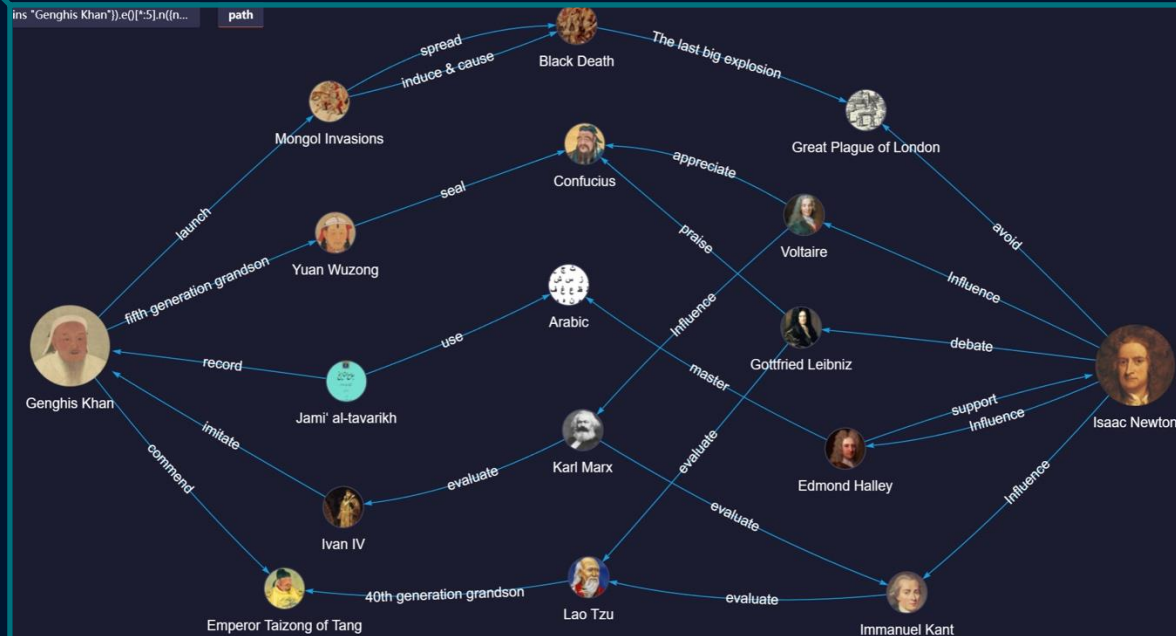
None.



Is there relationship between Newton and Genghis Khan in multi-steps



No, there is no known direct or indirect relationship between Isaac Newton and Genghis Khan.



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

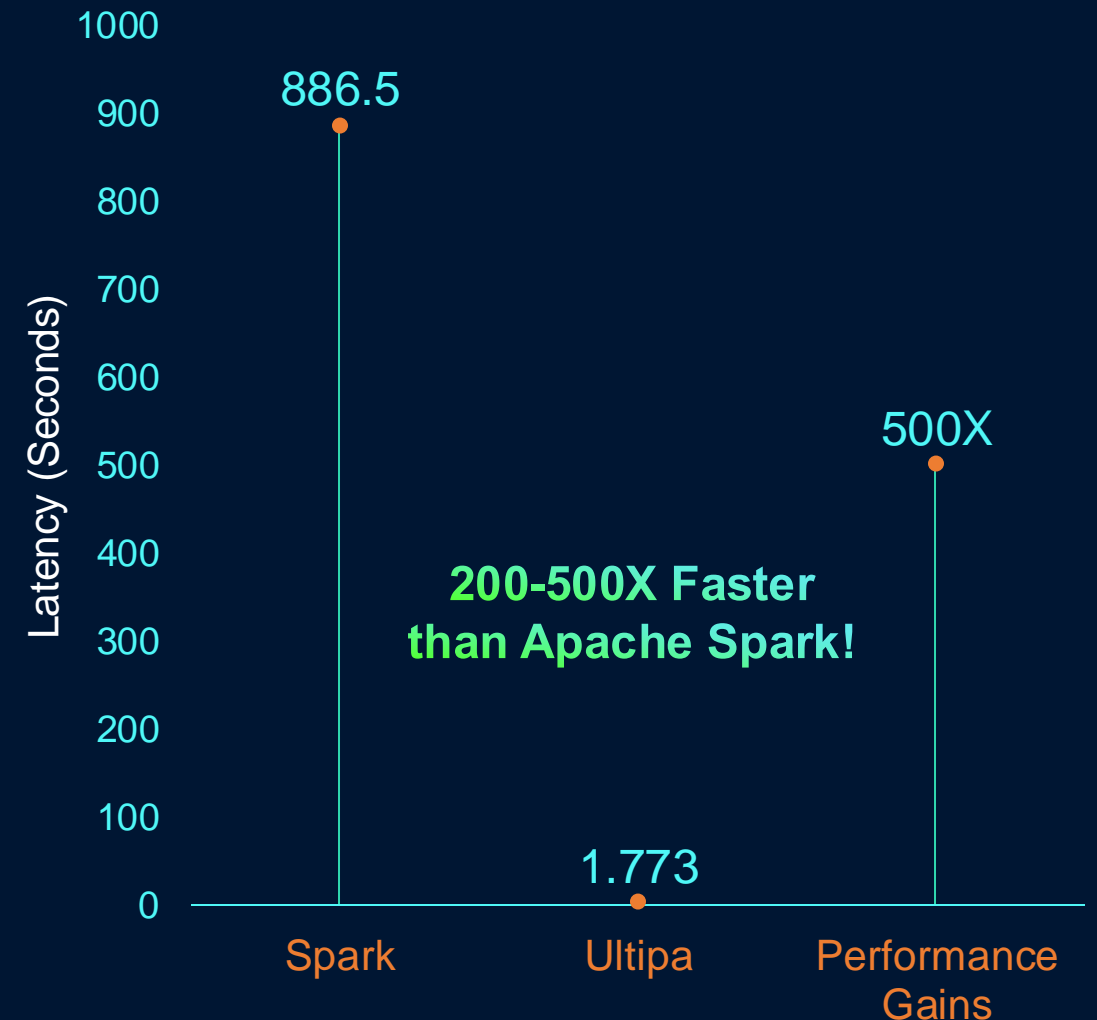
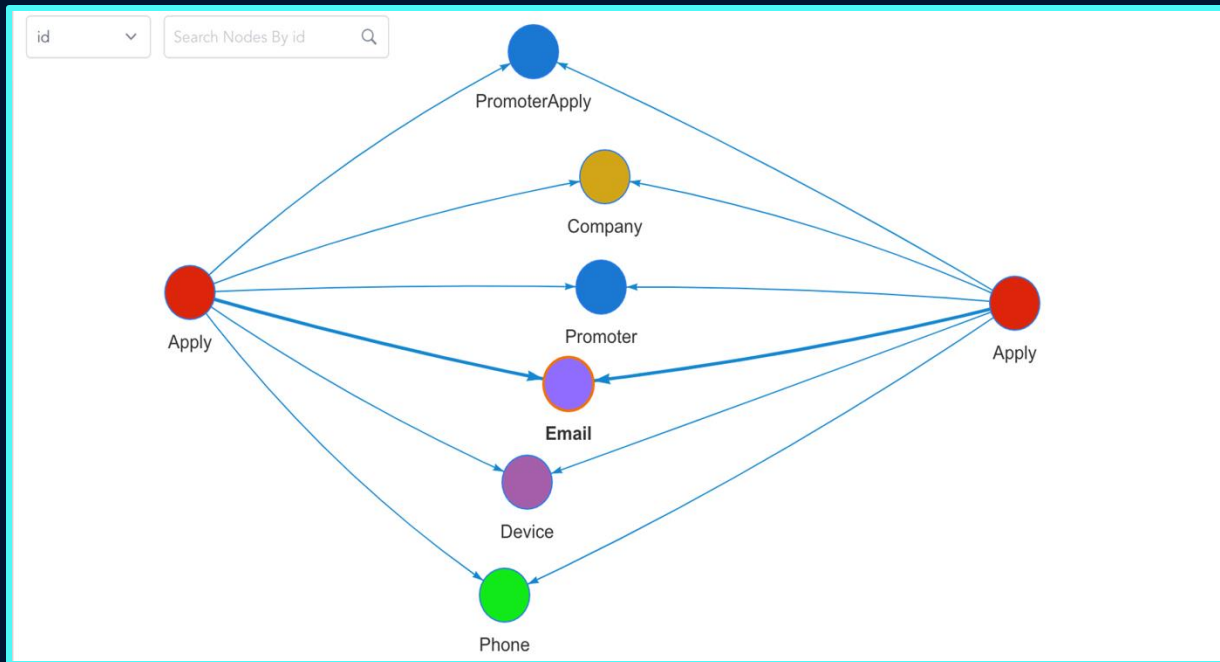
# Velocity: Fraud Detection & Real-time Decision Making

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

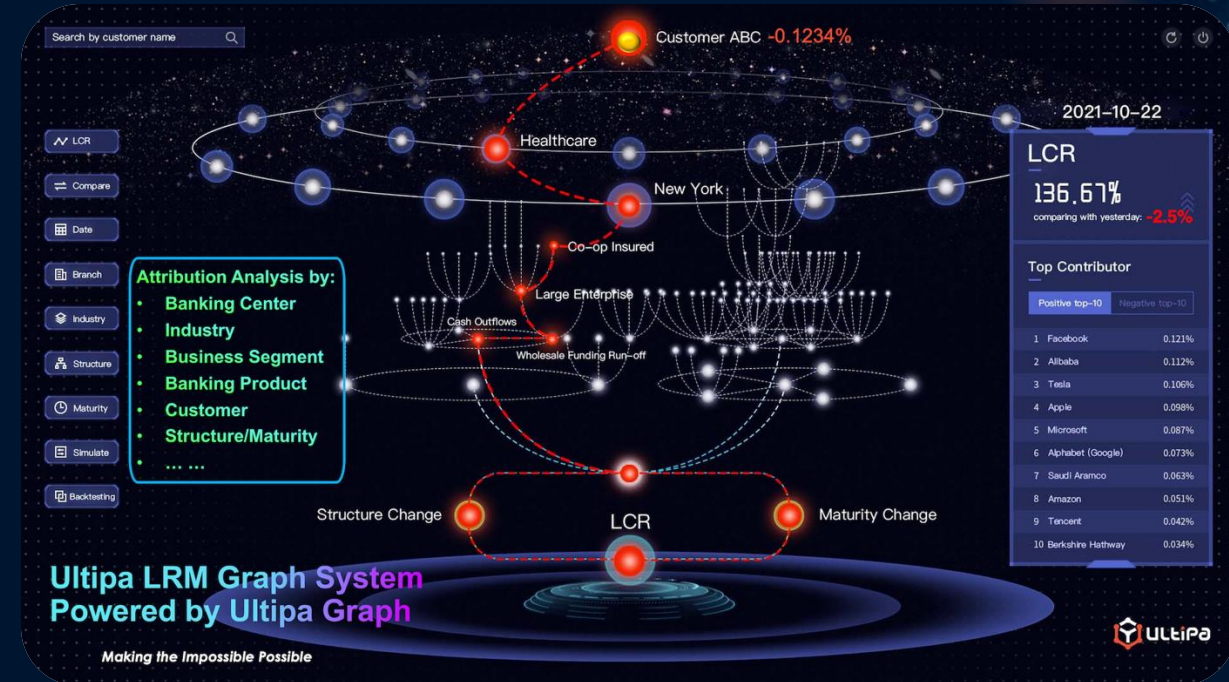
Ultipa Graph powered liquidity management and ALM turns risks into opportunities.

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

**300 Million** Transactions/Day

Regulatory Requirements: Daily Report ...

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

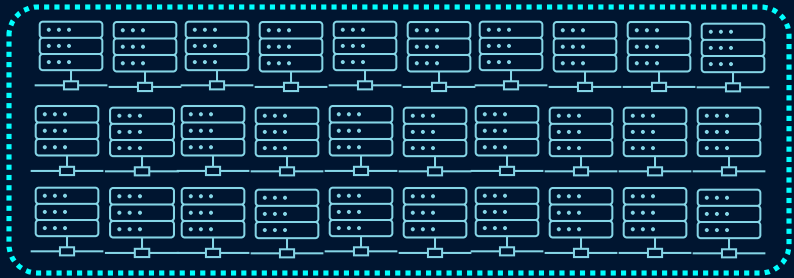


**Confidential**

# Ultipa XAI's Innovation & Benefits

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

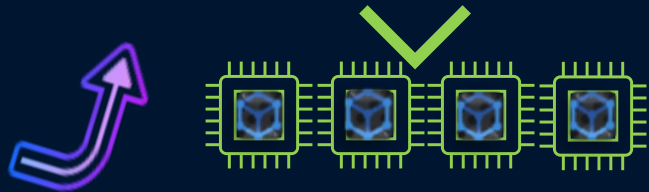
## High-Density Graph Computing



## Smaller Carbon Footprint



## Next-gen Business Intelligence



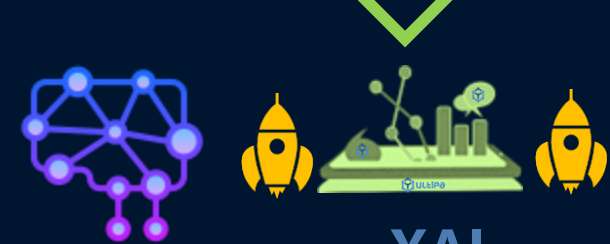
**10,000X Faster**

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



**70-90% Greener**

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



**XAI**

- **Productivity + Trust + Regulation**
- **Accurate Calculation & Prediction**
- **Deep Data Mining**
- **Explainable AI (XAI)**
- **Velocity (speed-up by 100X plus)**



Ultipa builds the world's fastest graph database and killer apps that empower smart enterprise with graph-augmented business data intelligence.

**Key Features of Ultipa Graph DBMS:**

- Micro-second Query Processing & Ultra-Deep Data Penetration
- Real-time Attribution/Contribution Analysis
- Real-time Stress Testing & Scenario Simulation
- Highly Visualized 3D Interactive Web GUI
- HTAP-MPP Cluster and Fast Deployment & Migration

**Ultipa Product Matrix:**

- Real-time Decision Making & Anti-Fraud System
- Intraday Liquidity Risk & Cash Management System
- Real-time Asset & Liability Management System
- Smart Data Intelligence Toolkits
- Smart BI & Advanced Analytics

**Contact Us**

www.ultipa.com  
support@ultipa.com

## Graph Power Play

Graph to Connect Everything  
Penetrate Everything  
Quantify Everything

## Computing Power

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

## Agility & Capability

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

## Killer Apps

Data Intelligence Toolkits  
Smart BI Applications  
Real-time Decision Makings

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