How AI Accelerates ML Development

Kumo's approach to intelligent data science

Overview

The last two decades have created an explosion of diverse and complex data
that contain a wealth of insights waiting to be uncovered.

While analytics tools accessed only lagging, surface-level insights, machine learning unlocked deeper value with predictions. Today's methods, however, offer little more than incremental business benefits for months of effort. The natural limitations of traditional data science have been reached, and a new approach is needed to deliver the next echelon of value.

Kumo uses artificial intelligence (AI) to accelerate the creation and performance of machine learning (ML) models. By streamlining the machine learning lifecycle and eliminating the need for feature engineering, Kumo produces model improvements up to 75% and growing. This approach uncovers more value from data and elevates the role of the data scientist, unleashing their creativity and modeling expertise.

Traditional data science

- Uses a representative subset of relational data with complex joins to build and train models.

- Build custom models using complex Python libraries with tedious feature testing and selection.

- Takes months to clean and prep data, test features and bespoke models based on hypotheses.

Kumo's intelligent data science

- Uses a graph data structure for efficient model construction and training.

- Speeds up model development in an AI-powered, low-code environment, bypassing complex feature engineering.

- Empowers experts to enhance models and adjust hy perparameters using their domain expertise, simplifying the modeling process.

Kumo is the leader in intelligent data science because it uses the power of graph structure to provide the highest performing models and most accurate predictions — down to the entity level. This is done by automatically converting relational data into graphs and using graph neural networks (GNNs), a class of AI models designed for graphs, to learn from relationships in the data. Kumo rapidly builds highly accurate models that keep pace with business questions with low-code, SQL-like queries that predict things like segments, lifetime value, behaviors, and more to improve personalization and recommendations.

Deliver Accuracy with AI

AI is the centerpiece of intelligent data science solutions like Kumo. Kumo uses GNNs because of their exceptional accuracy in making predictions across incredibly high volumes of relational data. This structured view of enterprise data allows for efficient access and analysis of large datasets, enabling quick identification of the right data for model training.

Kumo automatically transforms relational databases into graph structure based on primary-foreign key relationships in the data. The graph structure enables a deep understanding of interconnected relationships, specially designed to train GNNs. GNNs operate by taking graph data as input, converting it into intermediate embeddings, and feeding them into a final layer designed for specific prediction tasks.

This modeling approach outperforms many traditional approaches on tabular enterprise data, such as logistic regression, gradient boosted decision trees, and Bayesian networks. Therefore, GNNs have widespread application in recommendation systems, fraud detection, and forecasting, among others.

From relational data to GNN output
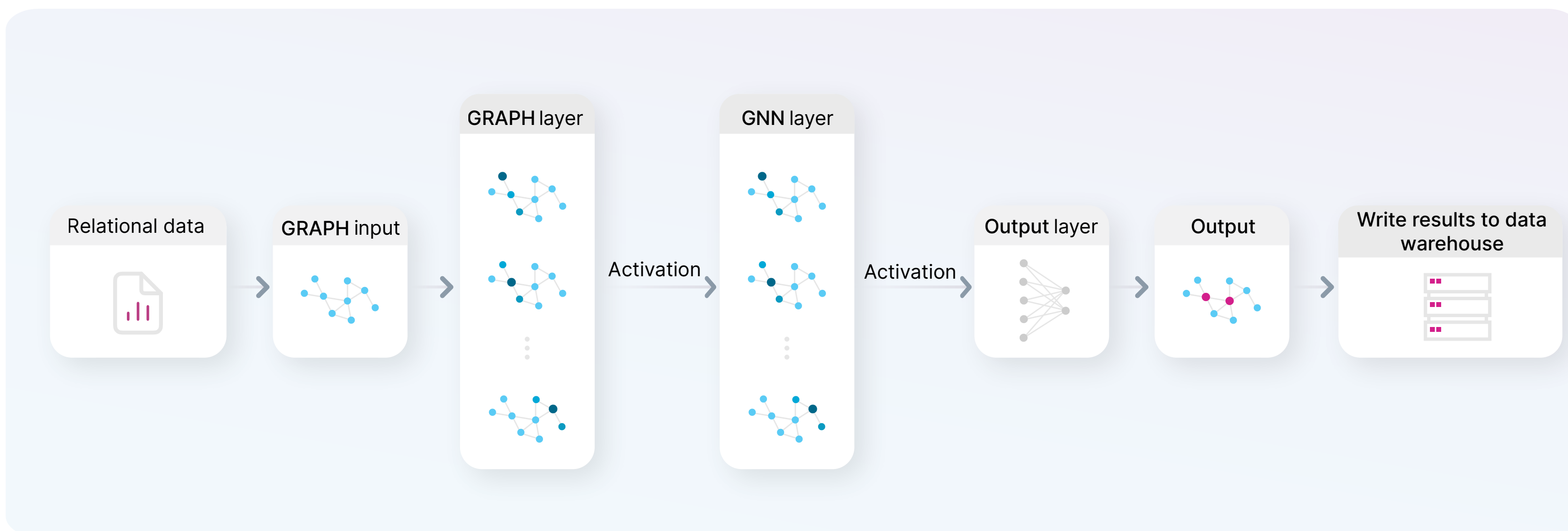
Eliminate Feature Engineering

Kumo saves time during model development because it eliminates the complex process of feature engineering through advanced deep learning methods. Keeping pace with business needs remains a significant challenge in traditional data science. Often, by the time a model is developed or enhanced, the business context has changed, rendering the work obsolete.
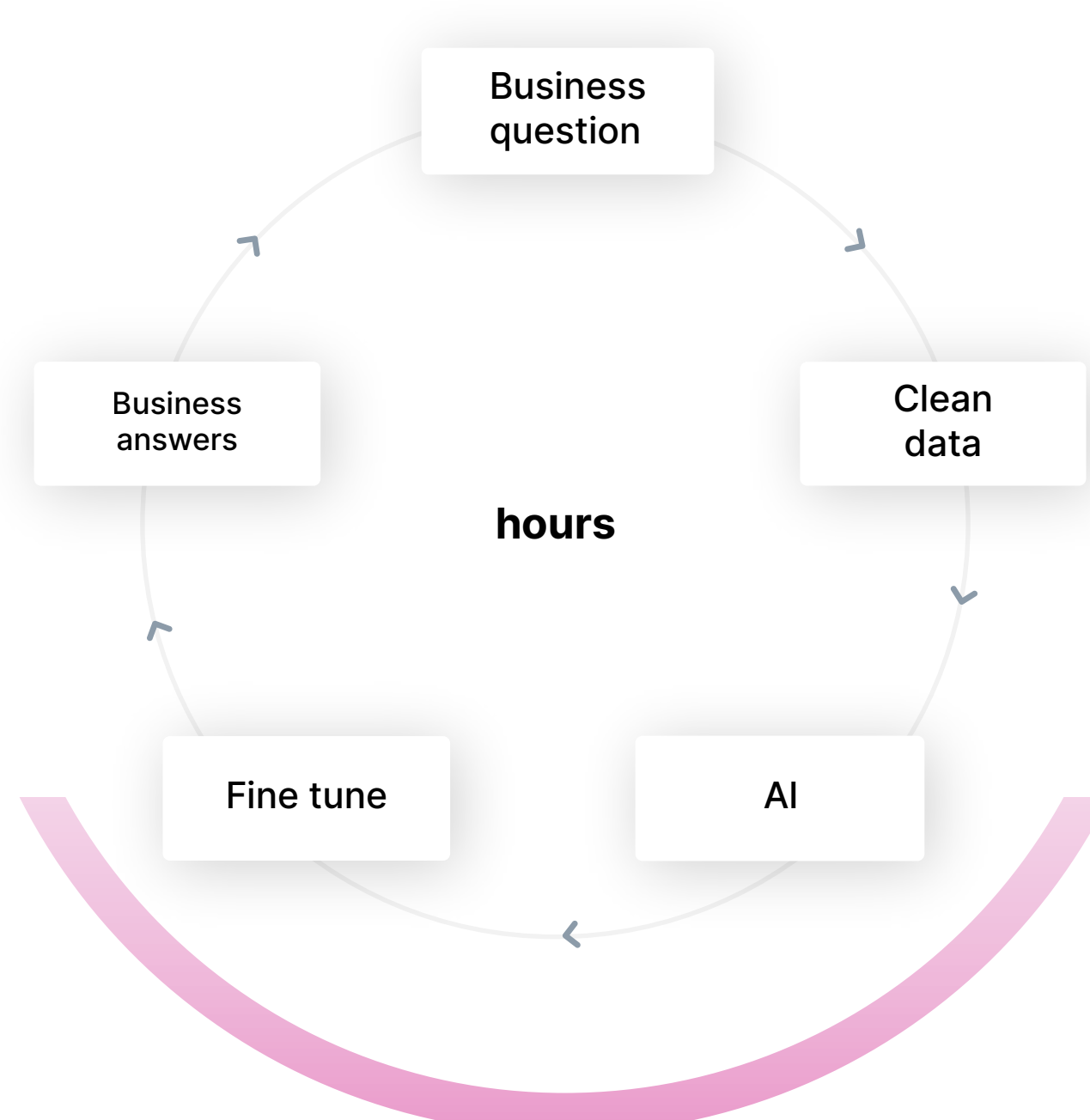
Kumo's GNNs use a graph sampling and aggregation algorithm, to automatically learn complex features which would traditionally need to be hand-crafted by a data scientist. Autonomous extraction of features from raw data, significantly enhances performance and reduces the time to production down to hours

TRADITIONAL DATA SCIENCE

Business questions
Data collection
Data cleaning & preparation
Exploratory data analysis
Feature engineering
Machine learning
Model evaluation
Data visualization
Business answers

6 - 9 months

90% OF TIME SPENT HERE

KUMO

Business question
Clean data
AI
Fine tune
Business answers

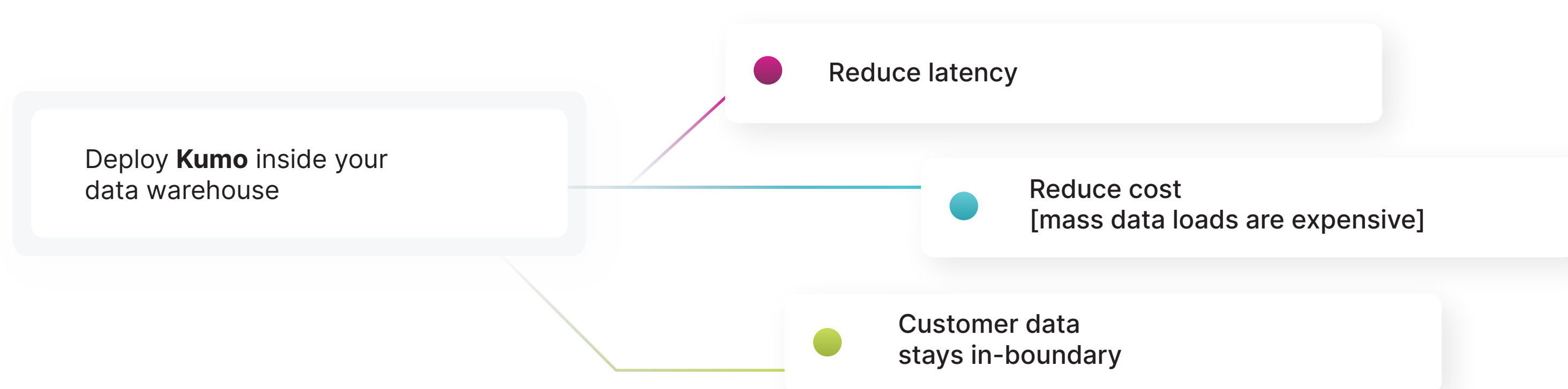**hours**

90% OF TIME SPENT HERE

Elevate Data and Domain Experts

Due to the time savings unlocked by Kumo's GNN, data science experts can focus on higher-leverage work to maximize model performance and drive business value. Kumo provides control over autoML search space, enabling data scientists to quickly explore many GNN architectures. Data science teams can define custom model plans, leveraging their domain expertise to fine-tune hyperparameters and refine models.
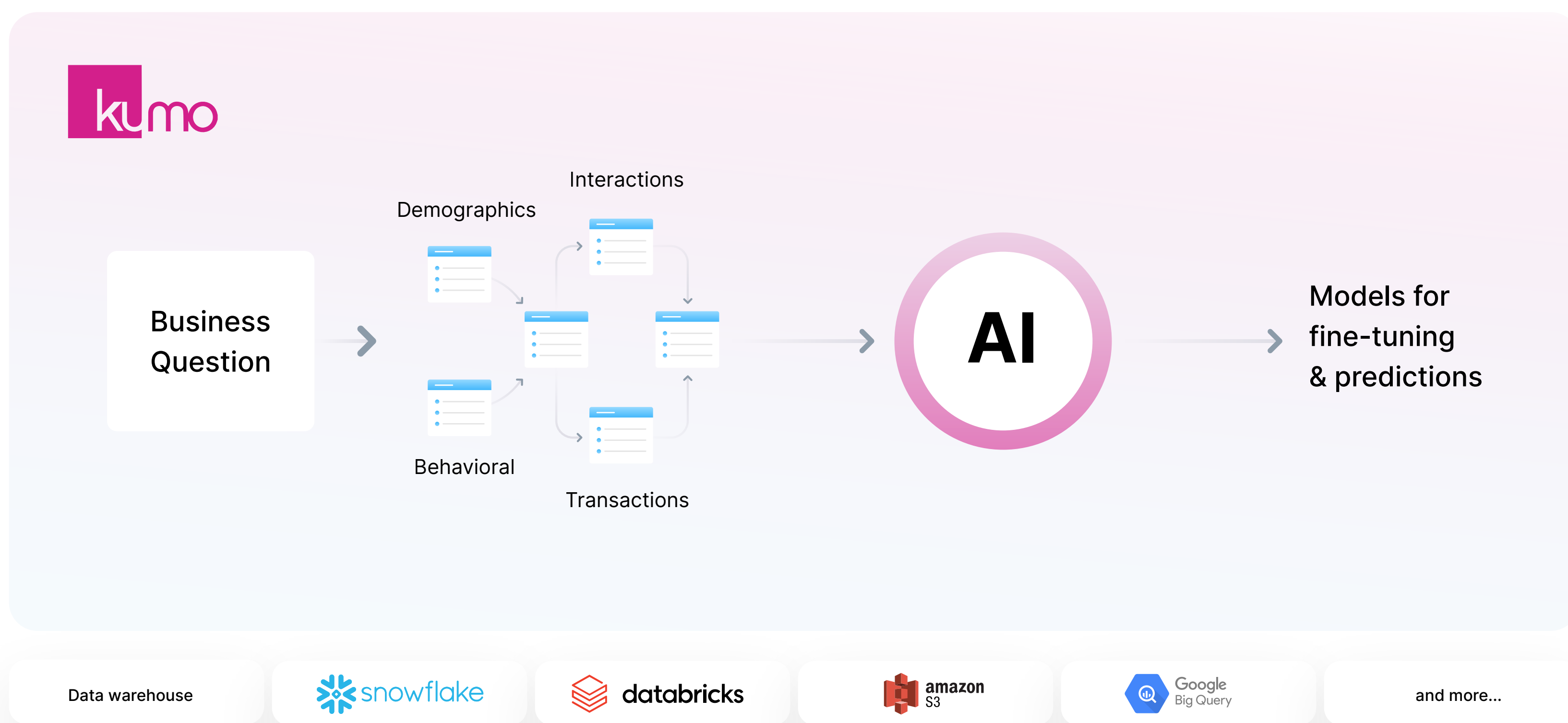
With Kumo, data scientists can take on more projects and answer questions faster to drive a measurable and sustainable business impact.

Activate the Data Warehouse

The data warehouse contains all the carefully curated business data from potentially dozens of internal and external systems. Unlike traditional ML approaches that only operate on single tables, GNNs can leverage the entirety of the data to produce the best models and predictions. Kumo integrates directly with the tables in the client's data warehouse, eliminating the need to maintain complex data loading and transformation workflows.

Deploy **Kumo** inside your data warehouse

- Reduce latency
- Reduce cost [mass data loads are expensive]
- Customer data stays in-boundary

Kumo Architecture Overview:

Business Question → Demographics, Interactions, Behavioral, Transactions → **AI** → Models for fine-tuning & predictions

| Data warehouse | snowflake | databricks | amazon S3 | Google Big Query | and more... |

Get Better Results

Kumo makes its out-of-the-box predictions accurate by checking data quality on relevant ingested columns and tables, supporting distributed model training, and providing MLOps tooling for detecting data drift. Further, Kumo's streamlined retraining pipelines ensure that the model stays responsive to changes in product, industry trends, or user behavior to help ensure the highest accuracy possible.

Kumo can generate predictions multiple times a day from the most recently retrained models, integrating predictions directly into platforms like Snowflake, Databricks, Amazon Redshift, or Google BigQuery for downstream use. Moreover, it facilitates automated exports of batch predictions at predetermined intervals, providing a consistent flow of data for informed business decisions and the best results in production.

Kumo accelerates time to value while delivering the highest performing models for exceptionally accurate predictions with model performance improvements of up to 75% compared to client models that have been hand-tuned for years.

Kumo's Success Across Industries

On-demand food delivery service

The business goal:
Generate new sales and improve engagement with targeted promotions.

The approach:
Predict all restaurants each user is likely to order from in the next 7 days.

The impact of Kumo:

Increased MAU by **90,000**

Added **$100 million in sales**

Cut serving costs by **80%**

Read the full story >

A major grocery chain

The business goal:
Increase revenue from existing customers through personalized coupons.

The approach:
For each shopper, predict twelve new and repeat products that drive conversion.

The impact of Kumo:

Increased new purchase model by **24%**

Increased repeat purchase model by **7%**

Improved models in **5 days**

Read the full story >

Online bank

The business goal:
Increase revenue by steering customers toward the most likely opportunity at the right time.

The approach:
Predict user intent across the top ten revenue generating opportunities.

The impact of Kumo:

Improved model by **11x**

Improved initial results by **73%**

Achieved production ready model in **4 days**

Read the full story >

Top Use Cases for Intelligent Data Science

Organizations onboard intelligent data science solutions like Kumo for revenue impacting KPIs like engagement, sales, and conversion.

Recommendations for a segment or individual

like item recommendation sent by email or notification, in-app recommendation for items including for cross-sell

Personalized experiences in app or website

like landing pages tailored to user preferences, unique ranking of products, responsive discovery experiences, individualized call to action and promotions

Next best action

like user behavior and marketing campaign decision making

Segmentation

like target audience, cross-channel marketing campaigns, lifetime value modeling, and ad campaign optimization

Funnel Acceleration

like lead ranking, conversion, and churn

Get Started with Kumo

Kumo's intelligent data science solution provides the combination of speed, accuracy, and continuous updates that empower organizations to respond promptly and effectively to business-critical questions, enhancing decision-making processes and operational efficiency.

Learn more at **kumo.ai** and get started with a **free trial**.