Predict, Plan, and Act with Confidence:

The Machine Learning Advantage

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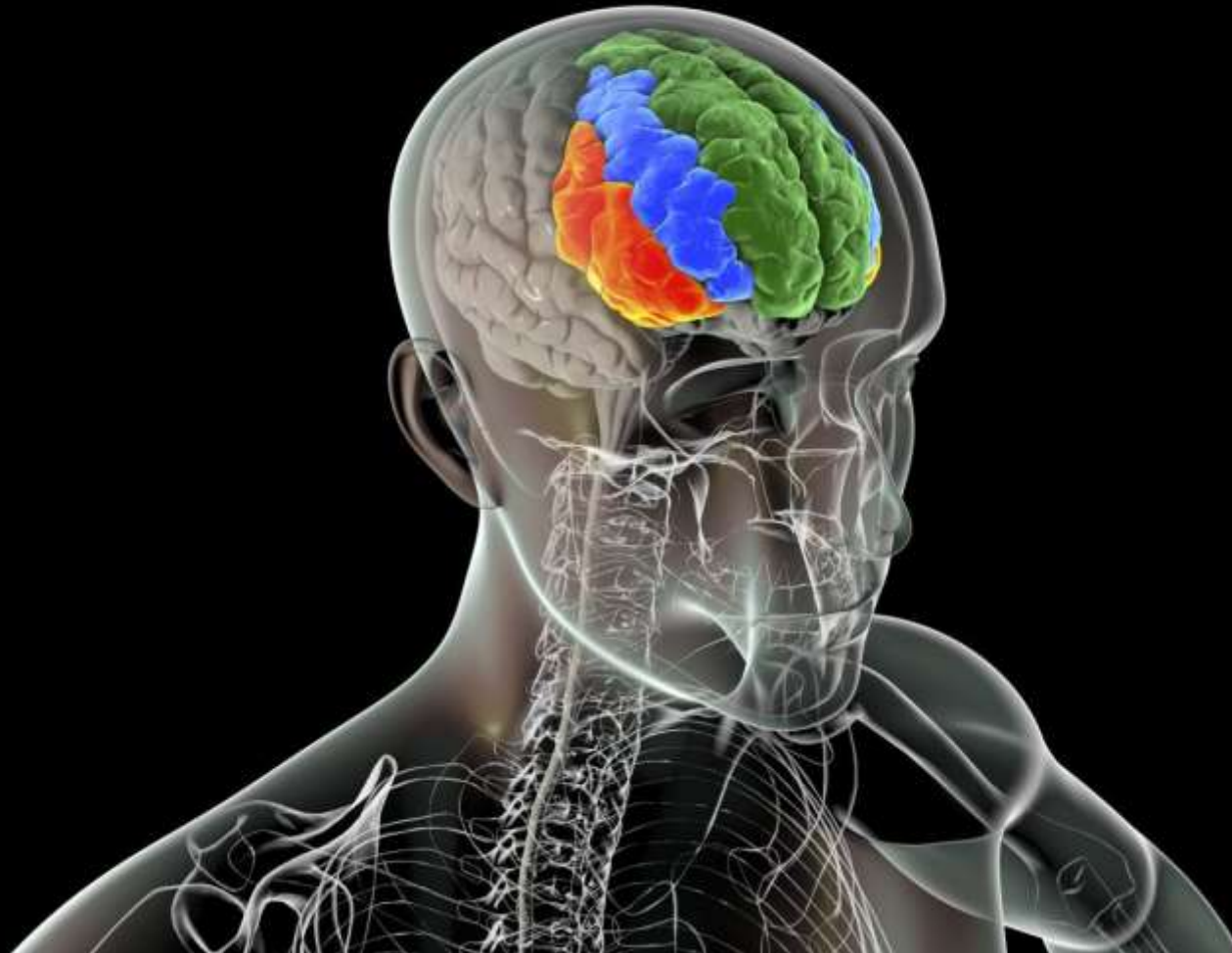Microsoft   IBM **Quantum**   VIRTUAL BLUE

02/ The Challenge

> " The greatest danger in times of turbulence is not the turbulence itself, but to act with yesterday's logic.
>
> Peter Drucker
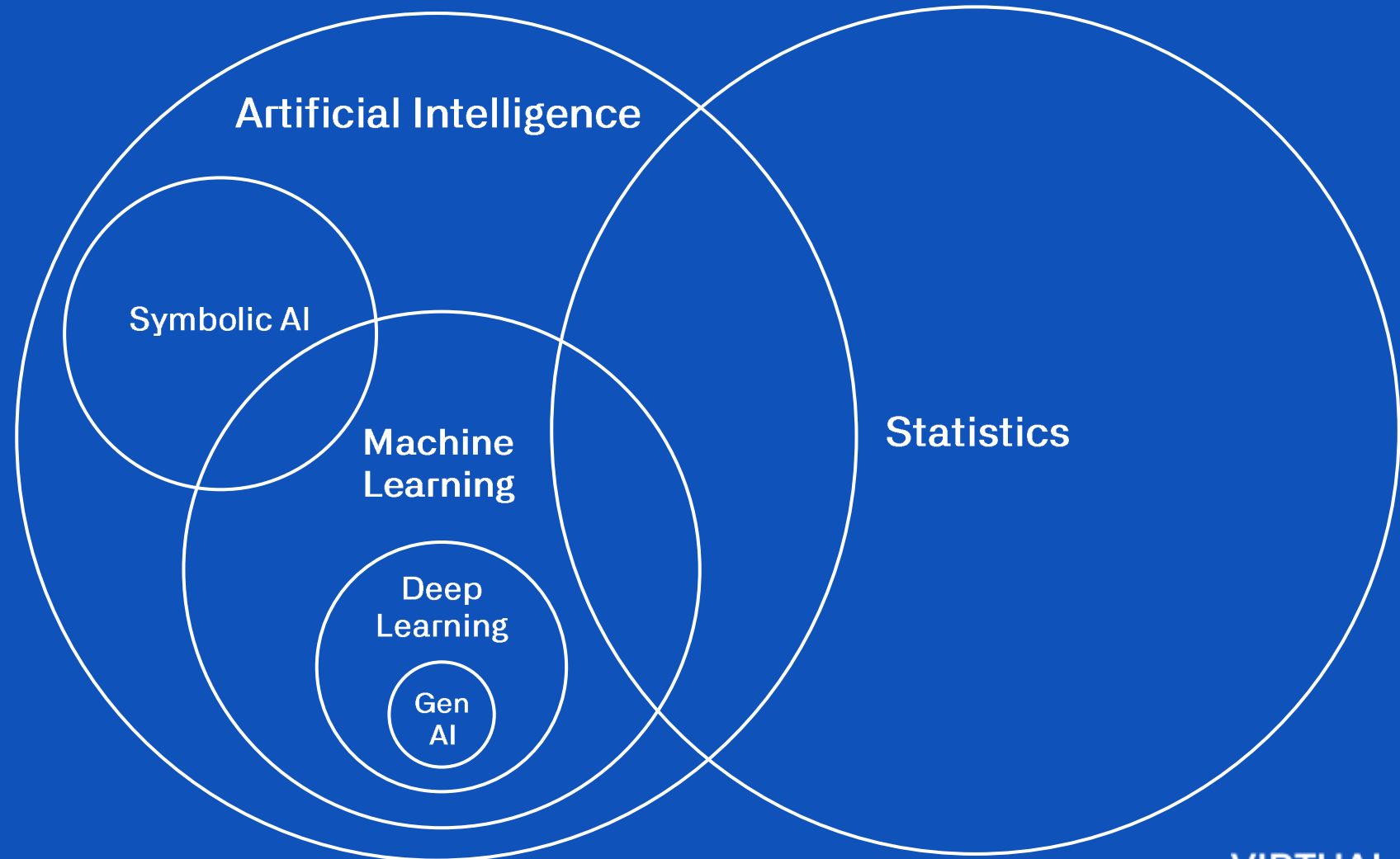
03/ From Savanna to Supercomputing

04/ The Solution

> " Predictive modelling is a mathematical process used to predict future events or outcomes by analysing patterns from a set of input data.

George Lawton

The Disease Control Priorities (DCP3) Chapter 18 risk model (Fan et al., 2017)

05/ The AI Landscape

Artificial Intelligence

Symbolic AI

Machine Learning

Deep Learning

Gen AI

Statistics

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06/ Key Lessons from the Field

- **Data Drives Precision**: Quality predictions rely on varied sources, e.g., historical performance, real-time news and social media sentiment/themes, IoT sensor data, economic indicators.

- **Causal AI Provides Confidence:** Identifies true drivers with probabilistic outputs, not just correlations.

- **Ensembles Drive Accuracy**: Combining models consistently outperforms single methods.

07/ Customer Success Stories

$3.2m Released in working capital for a national parts distributor by sharpening demand forecasts.

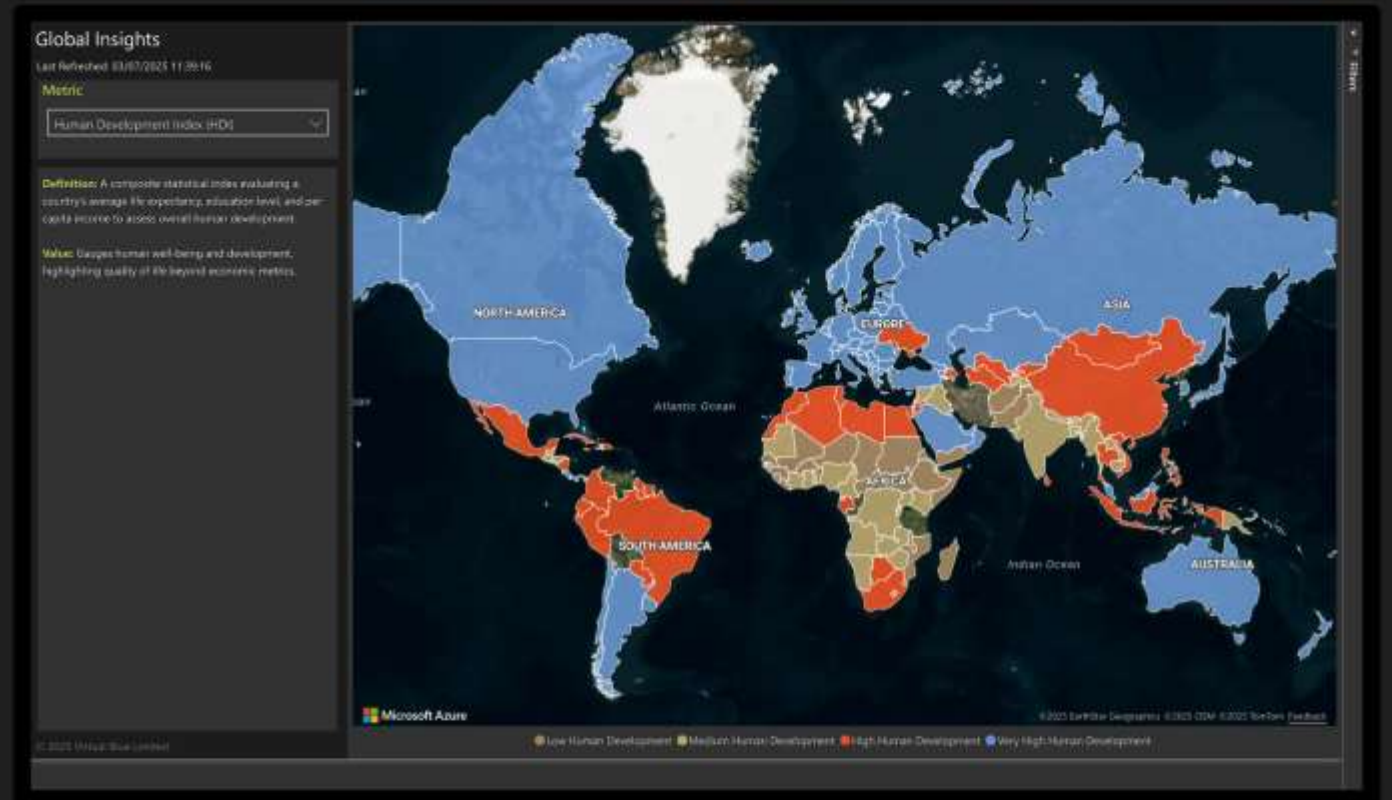**$18m** Captured in extra annual sales by precisely matching forestry output to U.S. processor demand.

$300k Avoided in hedging costs by acting on predictive signals of trade-policy volatility and locking cover in early.

Causality Demo

09 / Closing Thoughts

> " Causality is the key to prediction; randomness is just a symptom of missing causes
>
> Judea Pearl

Explore more at: https://www.virtualblue.co.nz/predictive-modelling

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