Decision Options ®

Artificial Intelligence for decisions

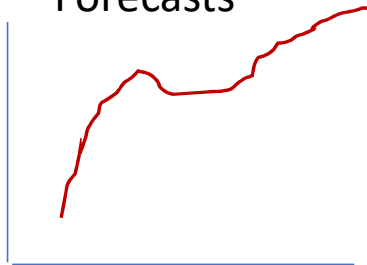|	
Company website:	www.decisionoptions.com
Founder:	http://decisionoptions.info/DoMain/Data/Sites/1/GillEapen.pdf
General email:	info@decisionoptions.com
Publications:	http://www.decisionoptions.com/publications

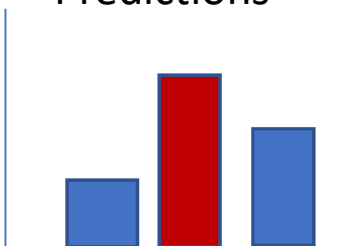# Decision Options ® for faster and better decisions for any problem

Forecasts

Forecasts based on historical data
- Products, processes, people, space, time, money…..
- A library of forecasting engines encompassing all known mathematical techniques
- Automated selection and optimization of mathematical techniques for best results

Predictions

Predicting the probability of an outcome
- A library of machine learning techniques – over 100 best of the breed engines
- A library of deep learning optimizers with automated configuration builders
- Automated selection for building meta models that combine multiple techniques

Patterns

Pattern finding in structured and unstructured data
- A library of machine learning techniques – over 25 best of the breed engines
- A library of deep learning optimizers with automated configuration builders
- Automated selection of the best technique for the data presented
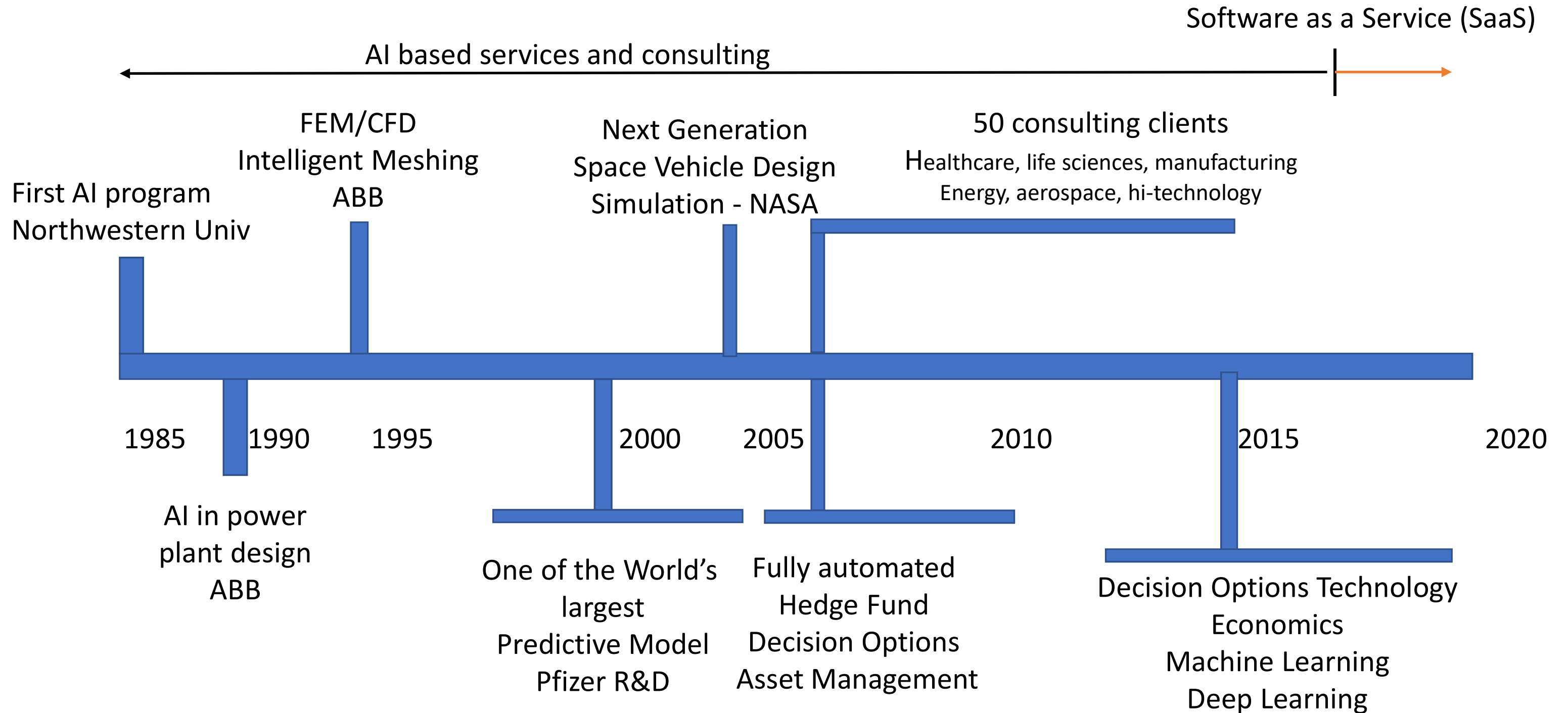
Value/Risk
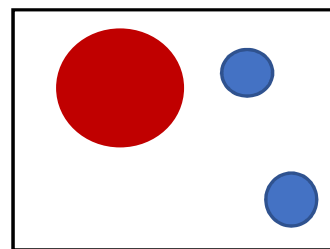
Economic valuation, risk assessment and portfolio management
- Application of options pricing principles in the valuation of private assets
- Flexible architecture to accommodate virtually any asset or decision problem
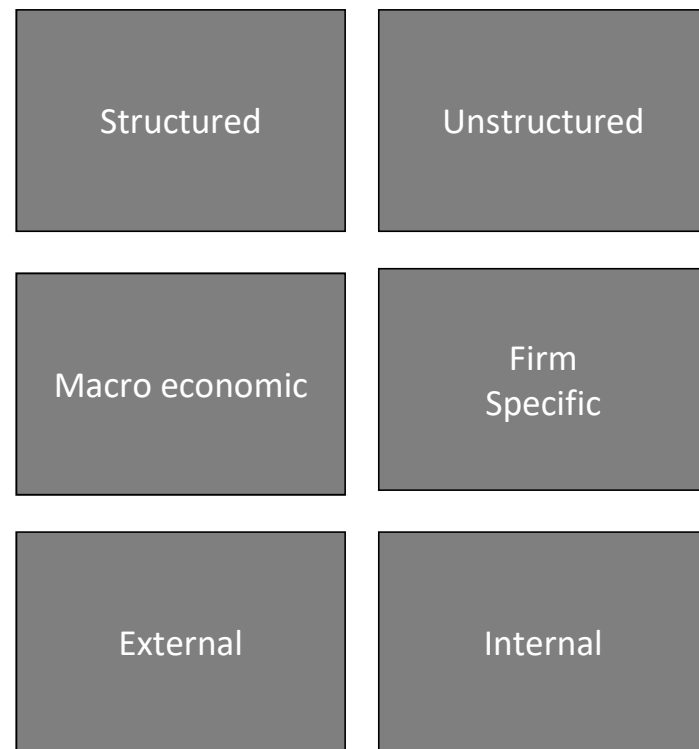- Optimization of a portfolio of disparate assets with interactions

We have a long history in analytics driven decision-making

Software as a Service (SaaS)

AI based services and consulting

FEM/CFD
Intelligent Meshing
ABB

Next Generation
Space Vehicle Design
Simulation - NASA

50 consulting clients
Healthcare, life sciences, manufacturing
Energy, aerospace, hi-technology

First AI program
Northwestern Univ

| 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |

AI in power
plant design
ABB

One of the World's
largest
Predictive Model
Pfizer R&D

Fully automated
Hedge Fund
Decision Options
Asset Management

Decision Options Technology
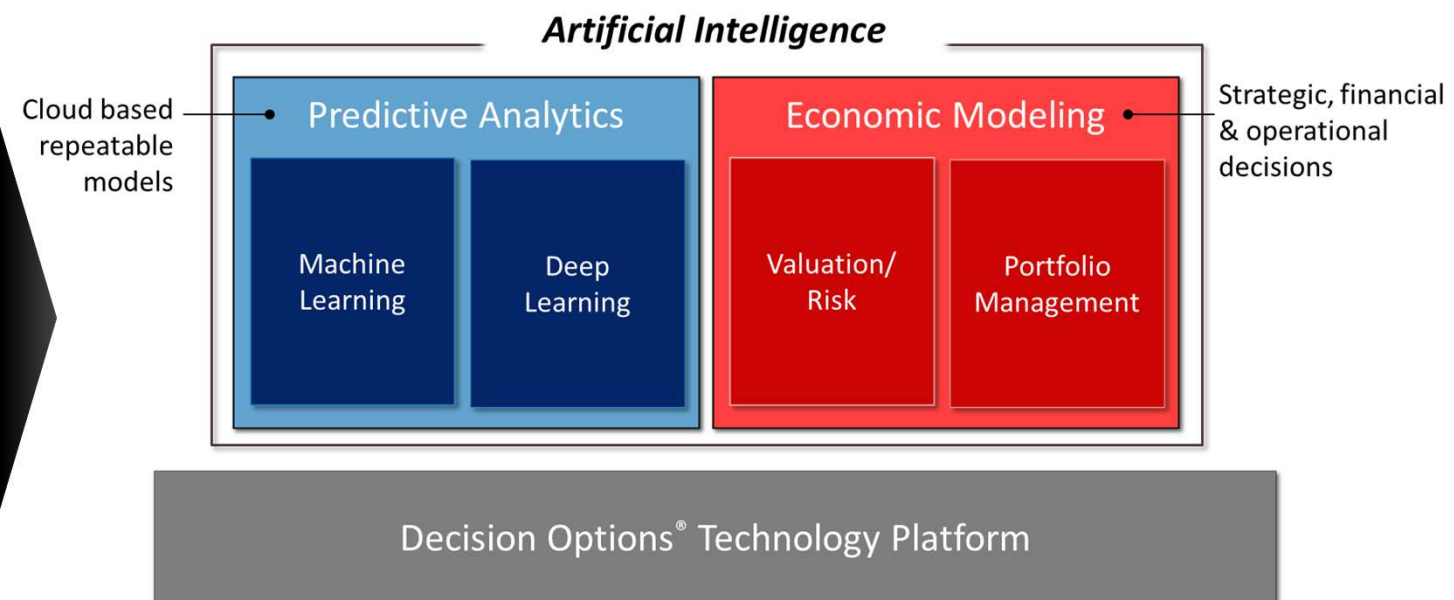**Economics**
Machine Learning
Deep Learning

Decision Options combines econometrics with machine/deep learning

Data

Structured	Unstructured
Macro economic	Firm Specific
External	Internal

Technology

Cloud based repeatable models

Artificial Intelligence

Predictive Analytics

Machine Learning	Deep Learning

Economic Modeling

Valuation/ Risk	Portfolio Management

Strategic, financial & operational decisions

Decision Options® Technology Platform
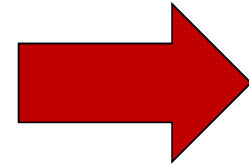
Decisions

Forecasts

Predictions

Patterns

Value/ Risk
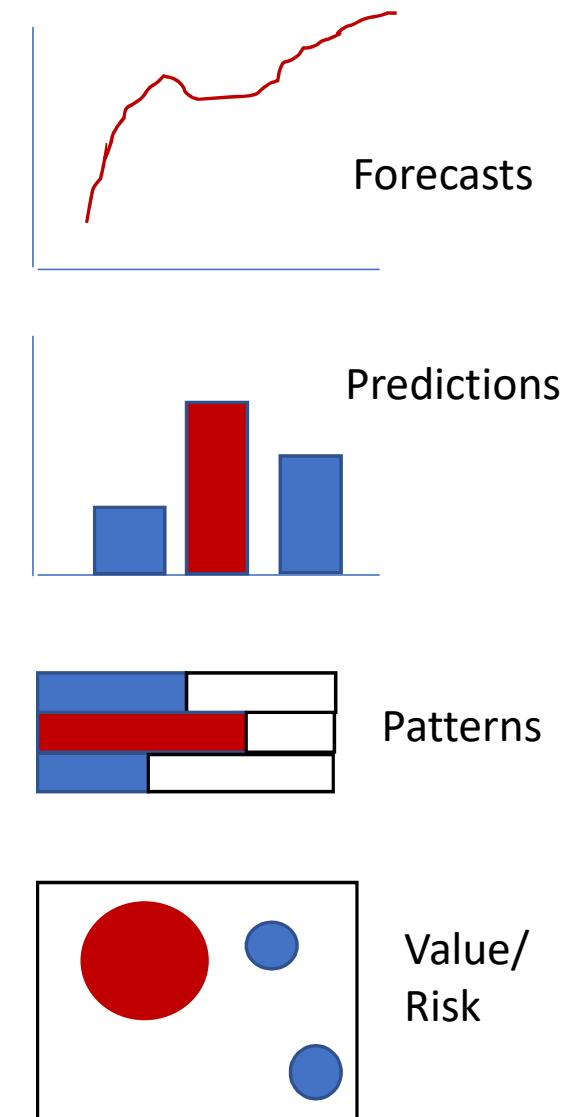
Cloud based technology architecture : always on and everywhere

Enterprise &
consumer
Data

Aggregated
Data

Master
database
In the cloud

Master Server

Available servers
In the cloud
Can be zero - infinite

Databases
maintained
by client
SQL/ORACLE/
HADOOP

Load balancing
Logic distribution
Data distribution

Predictive Analytics
Decision Analytics
Decision Options

DO knowledge base
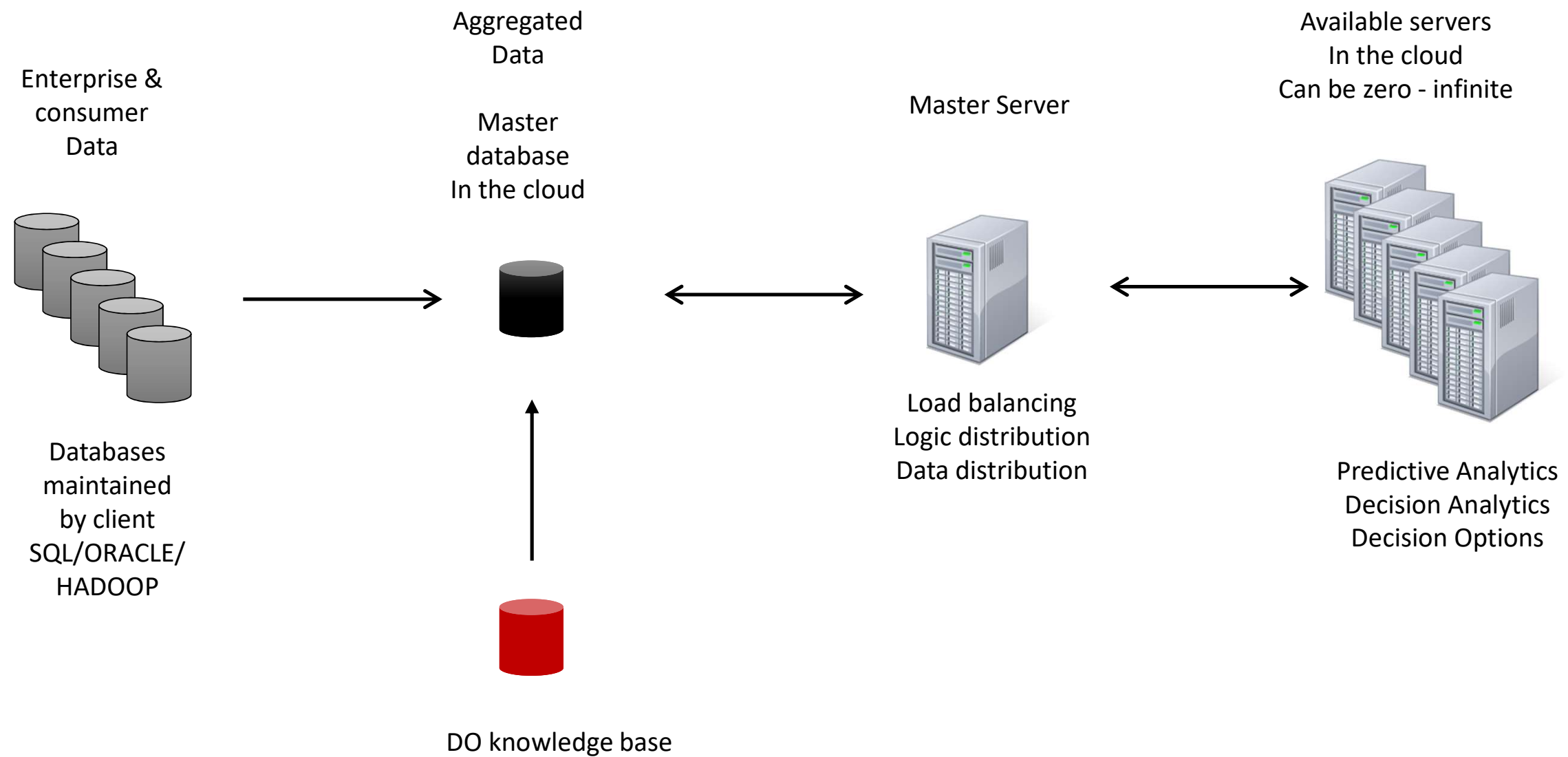
Decision Options ® : Autonomous Business Decision System

Disparate, dynamic and noisy data
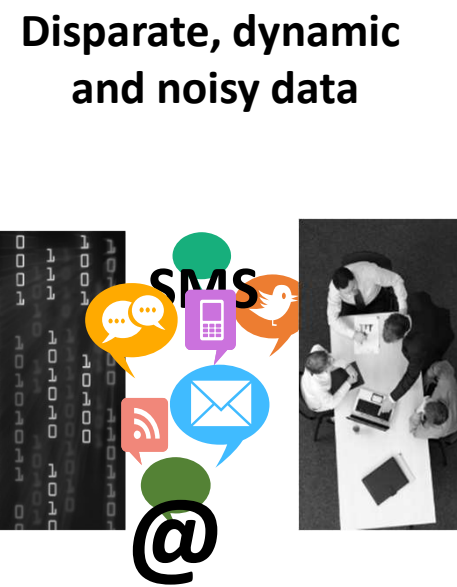
Models encapsulating Dynamic data
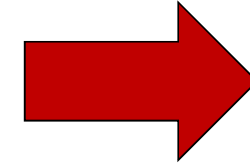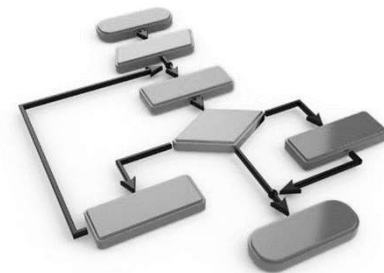
Decisions maximizing Outcomes & value

Example 1: Reducing forecasting errors in automotive manufacturing

- Large after market automotive component manufacturer in Detroit
  - 200K different SKUs, >$250 Million in inventory, carrying and obsolescence costs of >$25 Million/year
  - 2 manufacturing facilities, 3 distribution centers and retail customers across the country
  - CFO wants to reduce inventory without impacting stock out levels

- Decision Options system operating on top of ERP data on premise
  - A different model for each SKU forecasting for 12 months forward
  - Uses historical demand data from ERP as well as POS data directly from retailer
  - Able to reduce forecast errors by a factor 5 compared to status-quo
  - Targets inventory reduction of 15% from status-quo without impacting stock-out levels

- Differentiating aspects of Decision Options Artificial Intelligence
  - Agnostic platform, able to received data from any legacy system in a flat file
  - Able to report results on existing reporting and management systems
  - Learning models able to improve based on emerging data autonomously
  - Able to consume variety of data feeds including internal and external data such as GDP and weather

Example 2: Predicting disease risk in primary care patients

- Primary care clinic with >50 physicians and >50K patients
  - Payment to physicians by payers have quality targets
  - Physicians need to identify patients with disease risk for prevention and maintenance

- Decision Options system operates on EMR data on premise
  - Every night, EMR data flows into Decision Options database
  - Models built to predict disease risk prior to diagnosis and disease progression risk post diagnosis
  - Variety of diseases tracked including Diabetes, Hypertension, COPD and CHF
  - Risk scores assigned and updated on a daily basis on every active patient
  - Risk scores are reported on EMR screens as patients visit physicians
  - System creates automated scheduling of patients based on need for care and physician availability

- Differentiating aspects of Decision Options Artificial Intelligence
  - Agnostic platform – able to use any EMR vendor for data and reporting
  - Able to create incidence and progression risk for any disease modality
  - Able to use structured and unstructured data present in the EMR
  - Learning system – able to get better based on emerging data

Example 3: Pattern finding in human resources

- Large law firm in the Midwest needs to understand who is likely to be successful in the firm
  - Human resources at all levels – from associates and partners
  - Different hiring modalities – direct from school and lateral transfers from other law firms

- Decision Options system operating on HR, billing and project management data on premise
  - Data is pushed to Decision Options database on a regular basis
  - System imputes project success based on pre-defined financial metrics
  - Models are built on HR attributes that show commonality to project success
  - HR resources are clustered into buckets based on project success
  - System is able to predict success at intake of a new employee
  - System is able to suggest need for corrective actions for existing employees
  - System is able to suggest optimum compensation structures based on success rates

- Differentiating aspects of Decision Options
  - Agnostic platform able to receive any type of data from legacy systems
  - Able to finely control the number of different clusters
  - Learning system – able to retune pattern logic if major differences are found

Example 4: Valuation, risk and potential

- Large pharmaceutical company with >500 R&D programs requiring 4.5 Billion/year investments
  - Need to deploy limited resources – People, Money, Space and Time – across the alternatives
  - Complex problem requiring hundreds of people across the company to decide and maintain

- Decision Options system operating on a variety of data sources across the company
  - Assigns economic value, downside risk and upside potential for every program
  - Considers
    - Market and technical uncertainty
    - Uncertainty in costs, timelines, revenues and outcomes
    - Inter-relationships among longitudinal decision choices
    - Correlations among various assets in the portfolio
    - Stochastic and probabilistic uncertainties

- Differentiating aspects of Decision Options
  - World's first fully generalized economic modeling platform that values uncertainty and flexibility
  - Applicable in any situation, asset class or problem definition with stochastic and probabilistic features
  - Market based methodology, allowing private assets/companies to be fully translated to markets