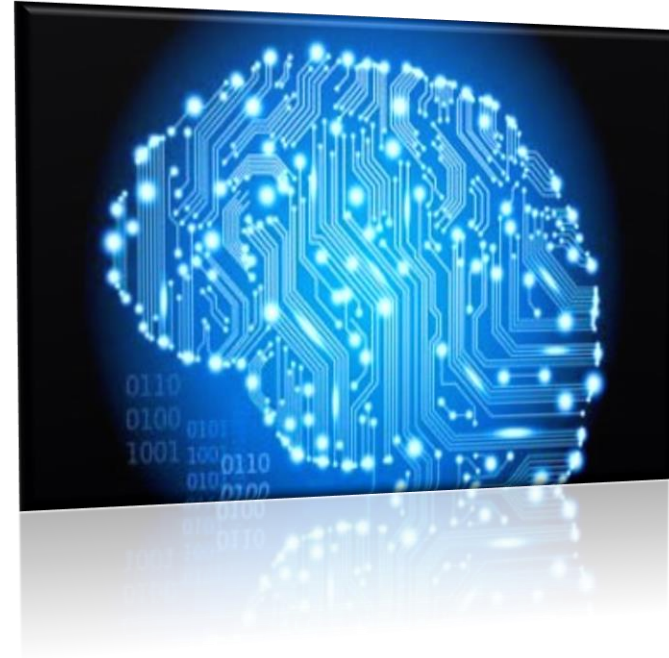




# Machine Learning and Analytics in Logistics and Supply Chain



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# Agenda



- Supply Chain: Challenges and Trends
- Introduction: Machine Learning and AI
- Case Study – ML and AI in Supply Chain and Logistics
- Getting Started with Machine Learning
- Conclusion



# Supply Chain Challenges



- Lower Prices
- Faster Delivery
- Higher customer service expectations
- Demand volatility
- High number of products
- Supply complexities
- More frequent shipments
- Transparency and sustainability



**“Companies that continue to utilize traditional supply chain models will struggle to remain competitive and deliver orders that are complete, accurate and on-time.”**



## A Lot of New Products

Today Amazon sells over 480 million products in the USA. Amazon's product selection has expanded by 235 million in the past 16 months.

That's an average addition of 485,00 new products per day.



**A typical Amazon fulfilment centre**



# A Very Long Tail Demand



0.9 million



1.2 million



1.7 million



6.7 million



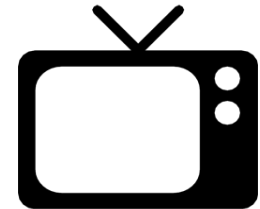
24 million



30 million



60 million



96 million



# Machine Learning and AI

## The Future is Here



- The most innovative companies in the world – that have disrupted their respective industries – rely on Machine Learning to drive their business processes and a great customer experience
- The future of business innovation has Artificial Intelligence (AI) at its very core
- Machine Learning (subfield of AI) is no longer restricted to research labs and is fast becoming the cornerstone of business disruption

**NETFLIX**

**amazon** echo

**OTTO**

**amazon** robotics

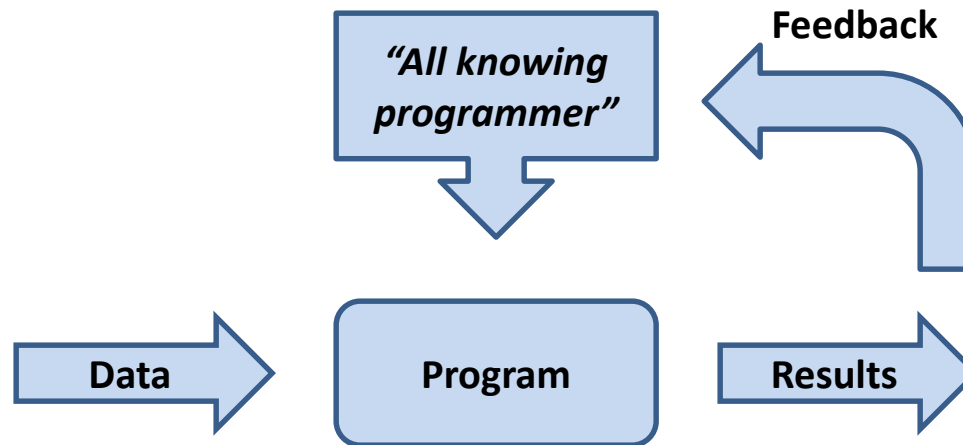
**nest**





# What was before Machine Learning?

**Humans** versus Machine

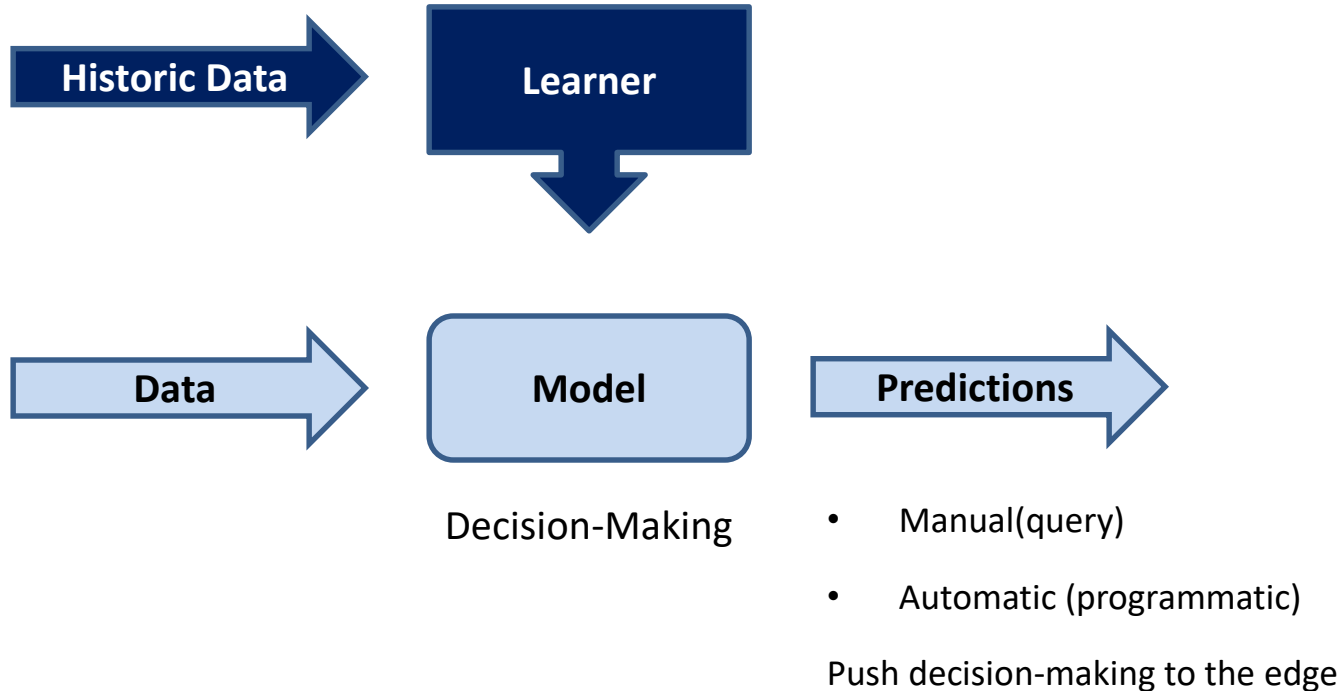


**Deterministic Future Outlook**



# Machine Learning in our Business

## Humans versus **Machine**



## Probabilistic Future Outlook





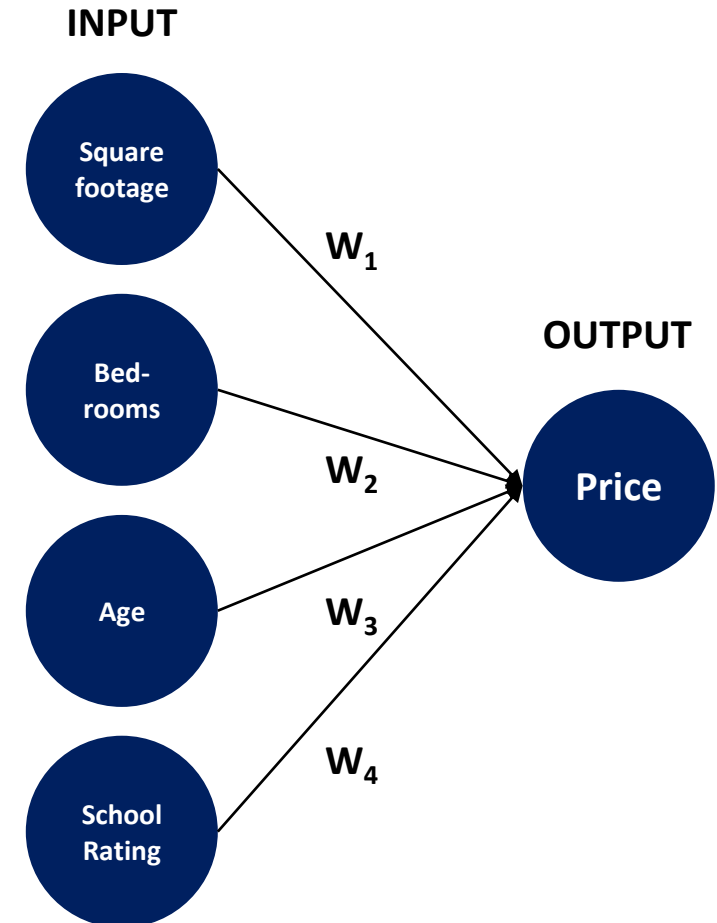
# Machine Learning Explained

Groundtruth

House No.	Square Footage	Bedrooms	Age	School Rating	Final Price
H1	1000	4	3	2	\$100,000
H2	800	3	1	4	\$90,000
H3	1200	5	3	5	\$125,000
H4	600	2	5	1	\$60,000
H5	1500	6	3	3	\$150,000

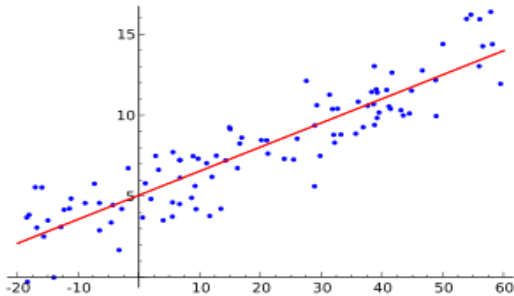
$PRICE(\text{Square Footage}, \text{Bedrooms}, \text{Age}, \text{School Rating}) =$

$$w_1 \times sf + w_2 \times br + w_3 \times age + w_4 \times sr$$

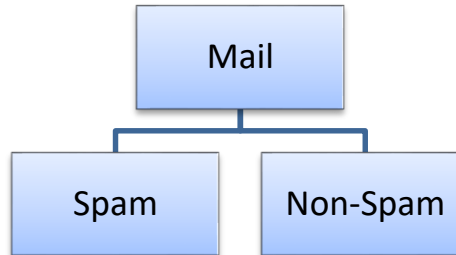




# Learning Algorithms



*Regression*



*Classification*



*Ranking*



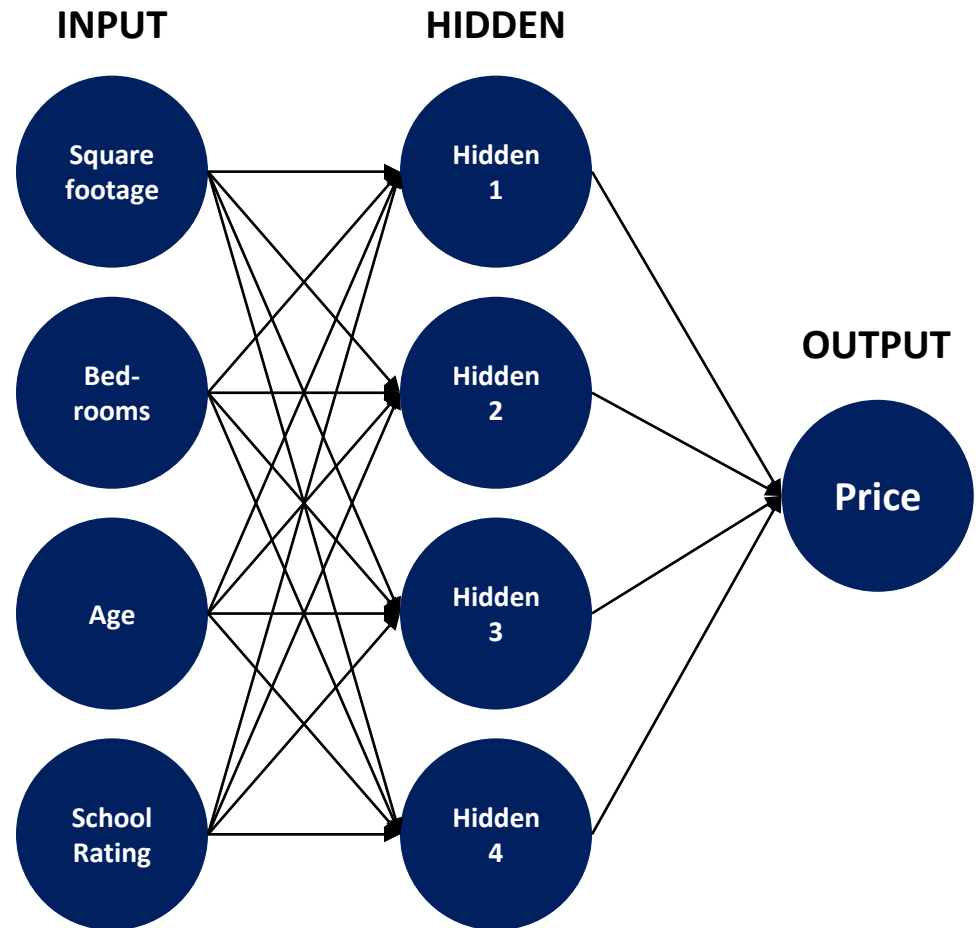
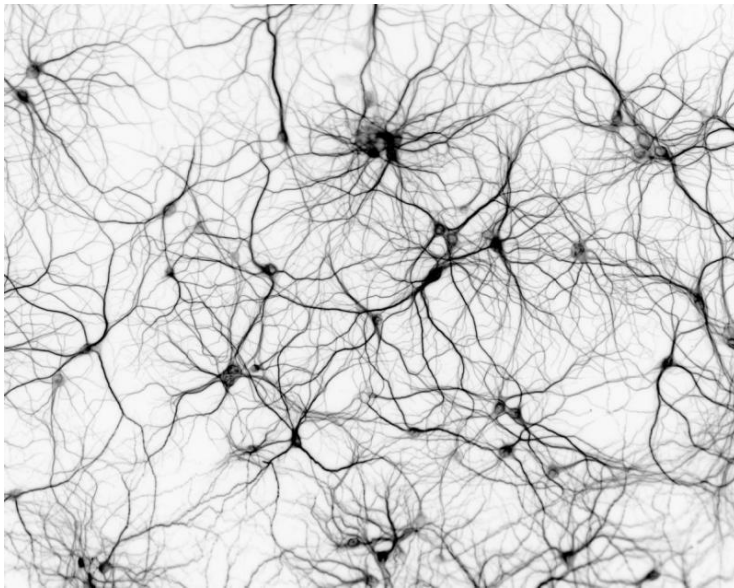
*Supervised*



*Unsupervised*



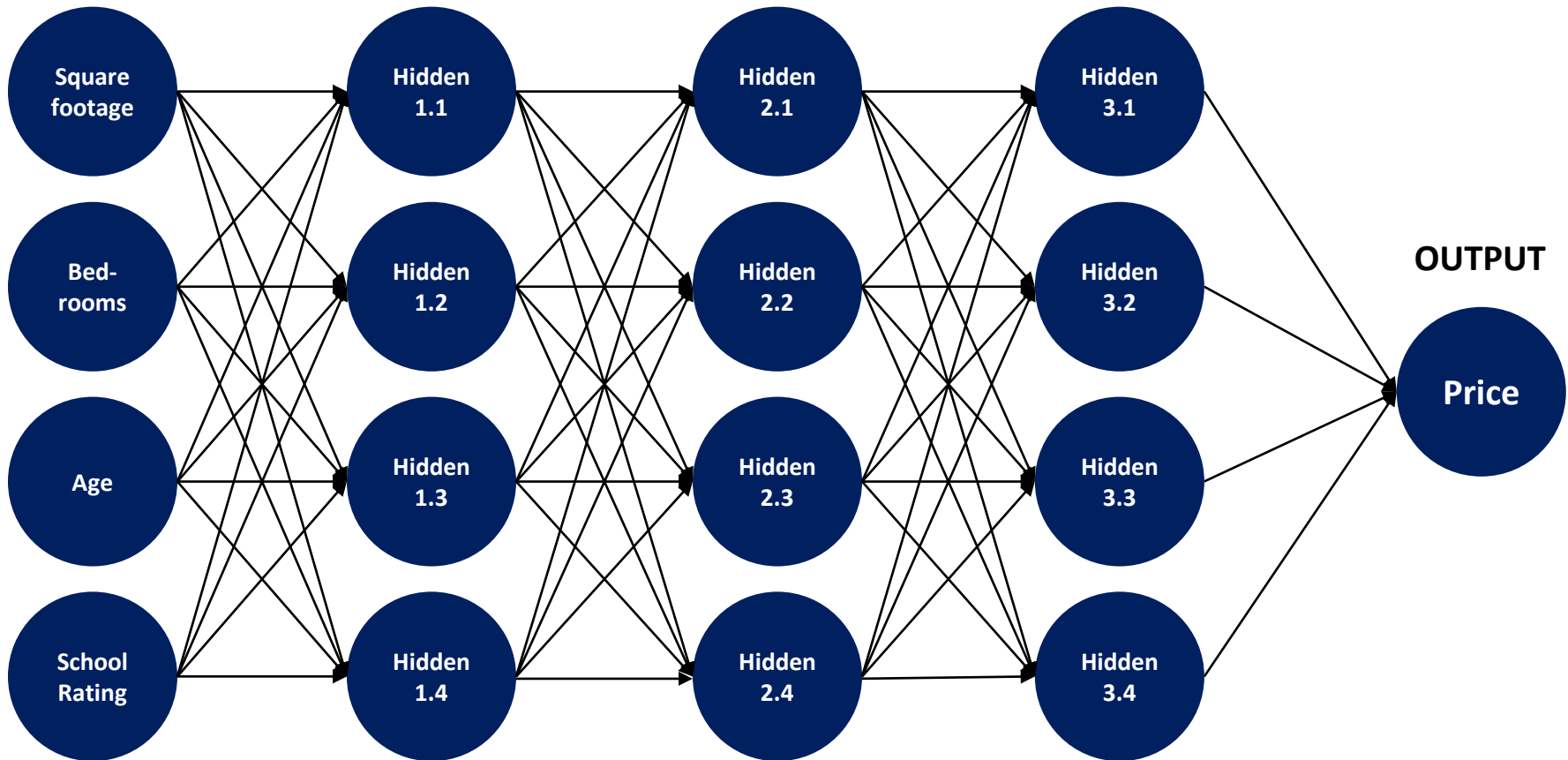
*Reinforcement*





# Deep Learning

**INPUT**



**OUTPUT**



## Case Study



### Transforming Supply Chain and Logistics

#### Business Challenge:

Develop real-time customer feedback and analysis framework to measure customer satisfaction levels.

#### Situation:

- Existing process was not capturing valuable customer data

#### Solution/Approach:

- Collect and aggregate the customer data on areas such as billing, complaints, repairs, contracts, social media and contact center calls.
- Big data analytics model provides real-time feedback and risk flagging for the customers on the verge of churning

#### Impact:

- Reduction in customer complaints & improved customer satisfaction levels



**Improving Customer Satisfaction**  
for a major Logistics Company



# Getting Started

**Start small by leveraging the cloud**



- Low hanging fruit: Business problem – “If we just knew...”
- Start Supervised: Historic data with ground truth
- Do not start with Big Data
- Use cloud-based offerings:
  - Microsoft Azure Machine Learning
  - Amazon Machine Learning
  - Google Cloud Machine Learning
  - Big ML



Google Cloud Platform



# Thank You

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