

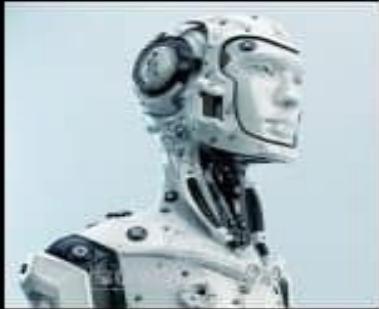


Machine Learning

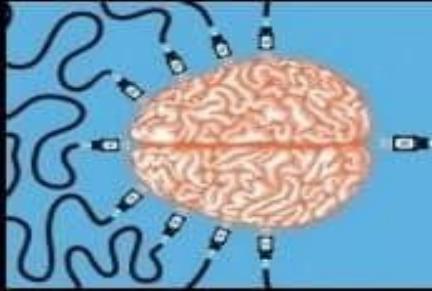
On Google Cloud Platform

What is ML?

Machine Learning



What society thinks I do.



What my friends thinks I do.



What computer scientists think I do.



What my boss thinks I do.



What I think I do.



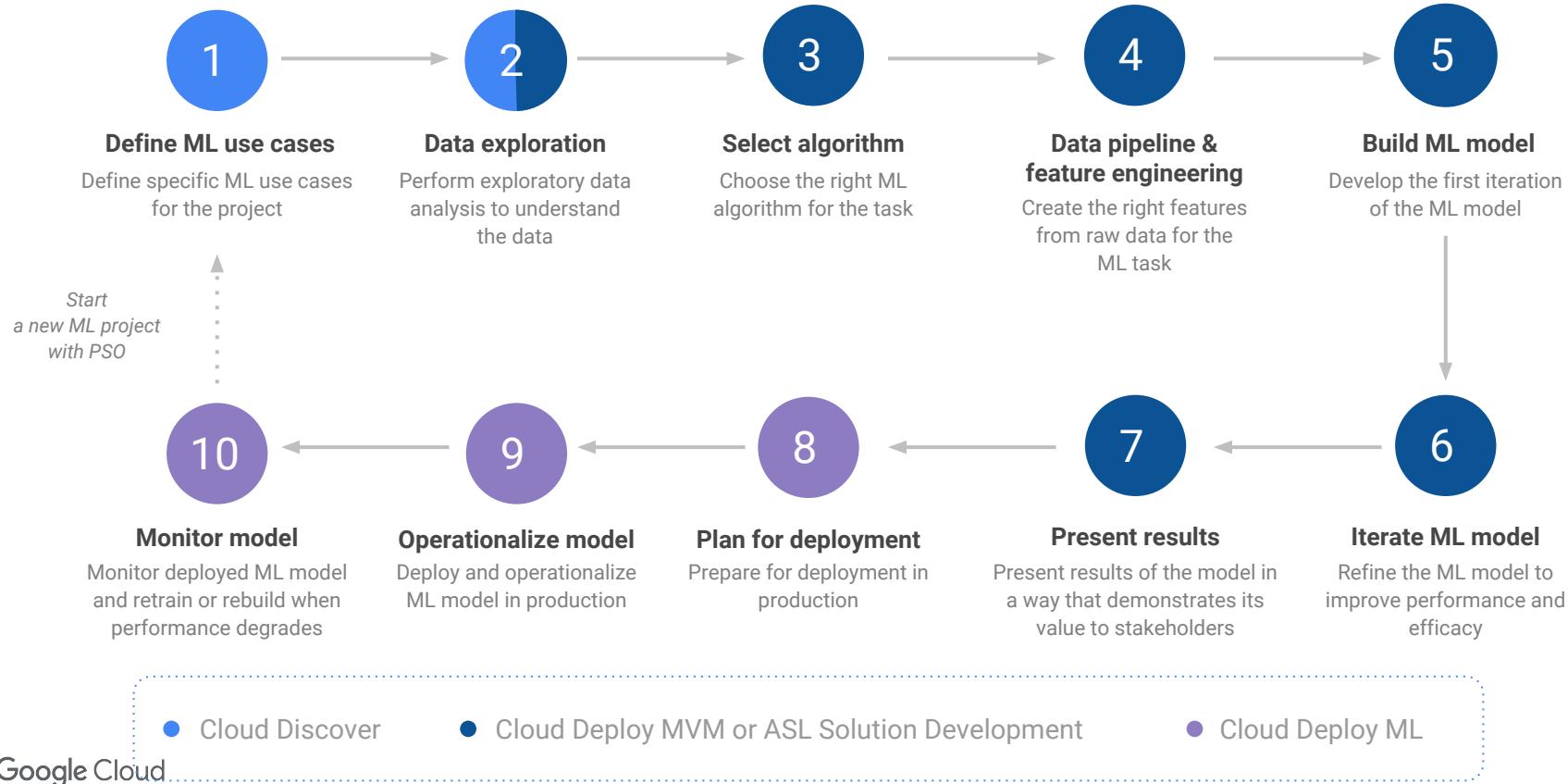
What I really do.

Machine learning...

- ... is loosely based on the way the human brain learns
- ... is a way of solving problems without knowing how to explicitly create the solution
- ... enables us to create systems that improve over time



Machine learning lifecycle



Google Cloud Platform & ML

Google Cloud end-to-end platform

Accelerate business outcomes with enterprise-ready machine learning pipeline



Industry use cases
In-loop inferencing for trained models

Manufacturing, retail, healthcare, insurance, security, media

Cloud AI products
Pre-trained ML APIs to building custom ML models



ML Framework
Industry-standard and widely adopted



Infrastructure
Best-in-class accelerators for ML

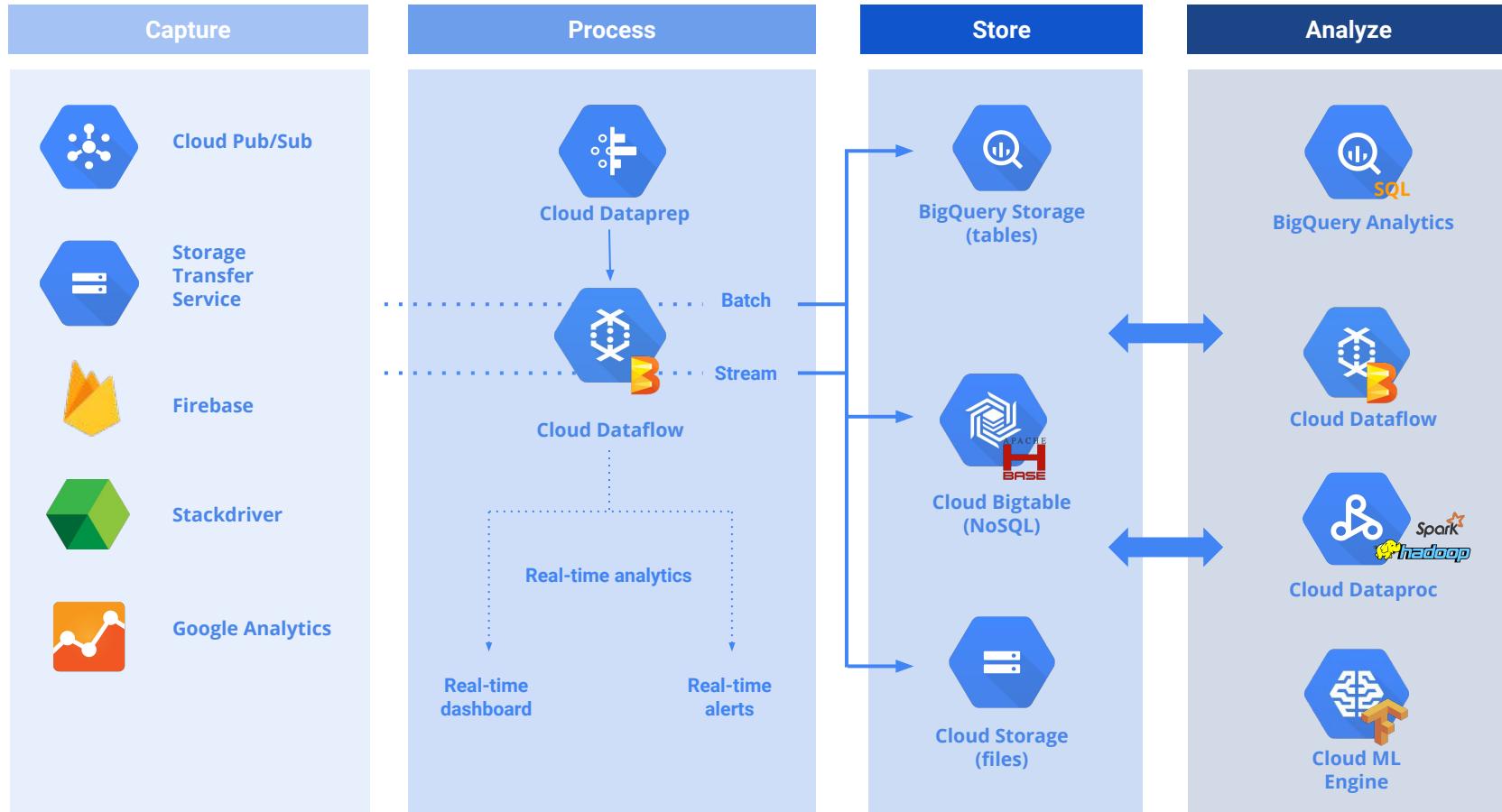
CPU

GPU



TPU





Use cases (examples)

Cloud Machine Learning Use Cases

Manufacturing

- Predictive maintenance or condition monitoring
- Warranty reserve estimation
- Propensity to buy
- Demand forecasting
- Process optimization
- Telematics

Travel and Hospitality

- Aircraft scheduling
- Dynamic pricing
- Social media – consumer feedback and interaction analysis
- Customer complaint resolution
- Traffic patterns and congestion management

Retail

- Predictive inventory planning
- Recommendation engines
- Upsell and cross-channel marketing
- Market segmentation and targeting
- Customer ROI and lifetime value

Financial Services

- Risk analytics and regulation
- Customer Segmentation
- Cross-selling and up-selling
- Sales and marketing campaign management
- Credit worthiness evaluation

Healthcare and Life Sciences

- Alerts and diagnostics from real-time patient data
- Disease identification and risk satisfaction
- Patient triage optimization
- Proactive health management
- Healthcare provider sentiment analysis

Energy, Feedstock and Utilities

- Power usage analytics
- Seismic data processing
- Carbon emissions and trading
- Customer-specific pricing
- Smart grid management
- Energy demand and supply optimization

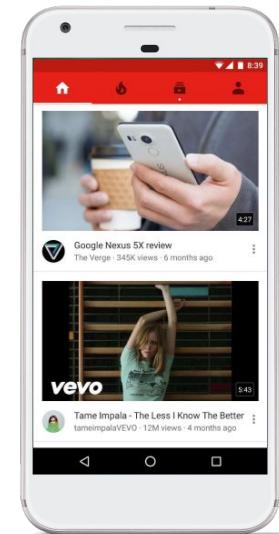
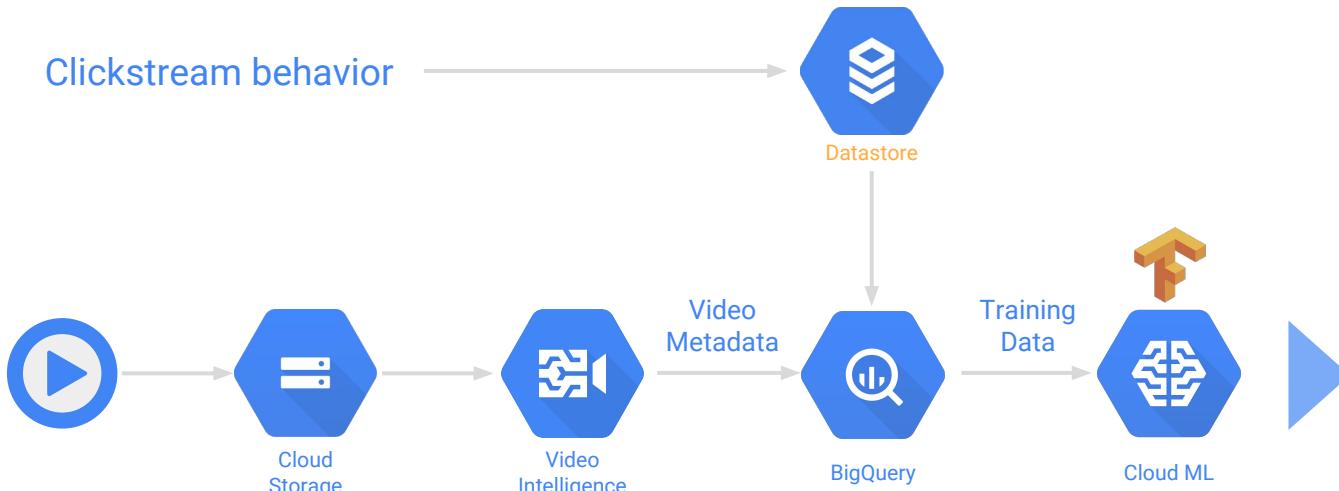
Recommend content

[YouTube Video Recommendations Research](#)
[Paper*](#)



Recommendations
displayed on YouTube
mobile app home

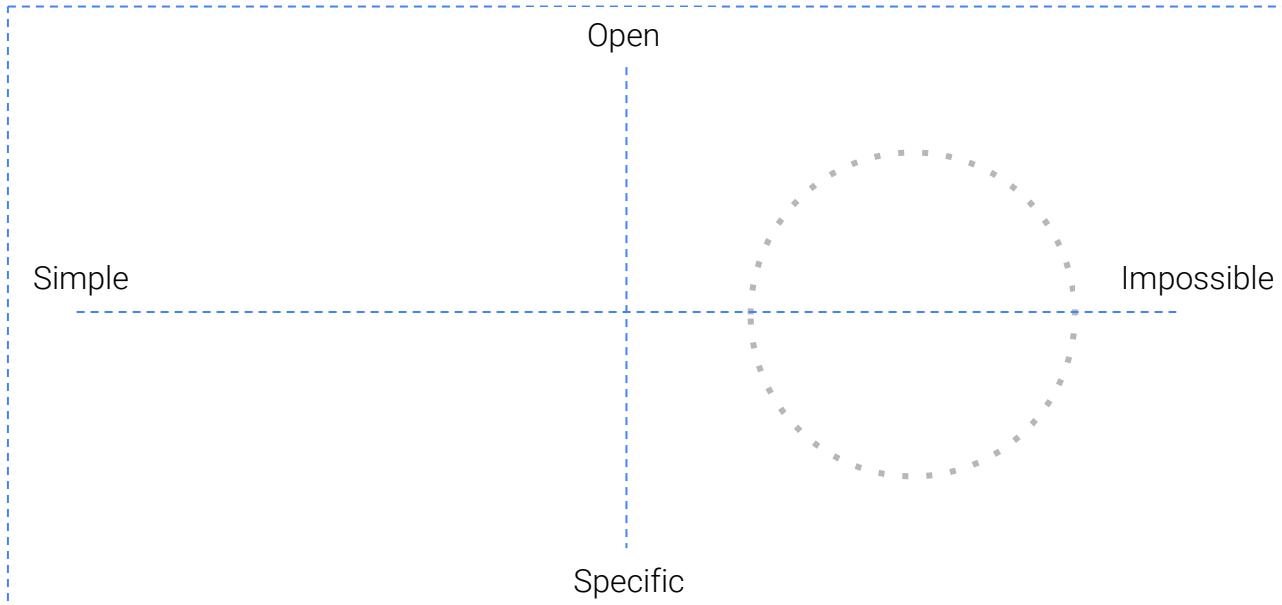
Clickstream behavior



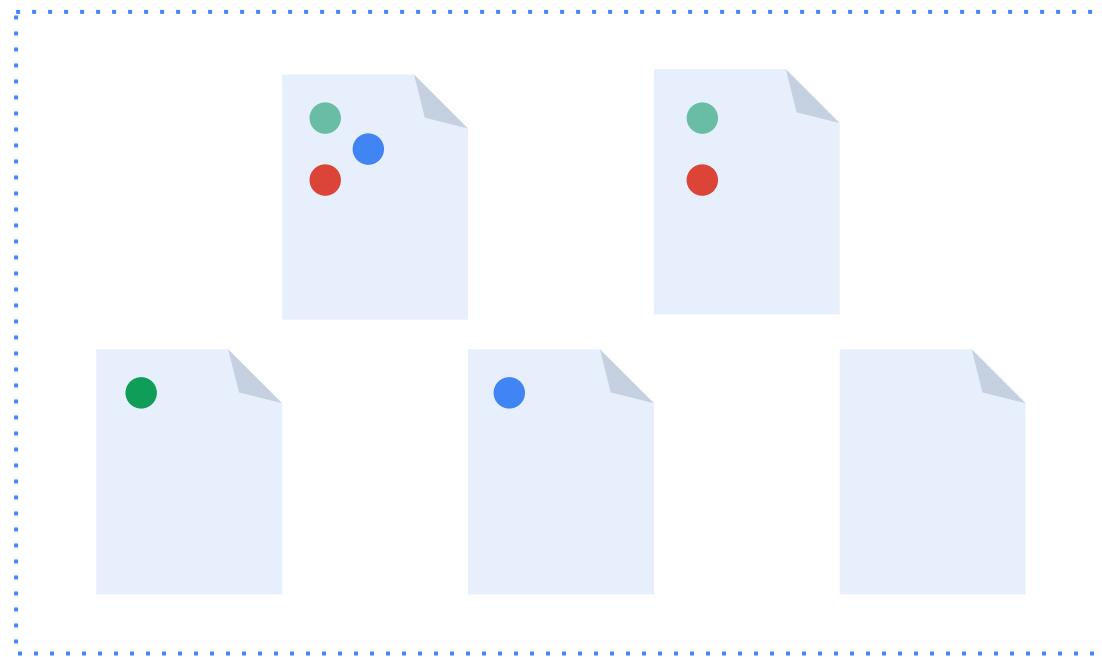
*Deep Neural Networks for YouTube Recommendations" by Covington et al., RecSys 2016

How to define them use cases?

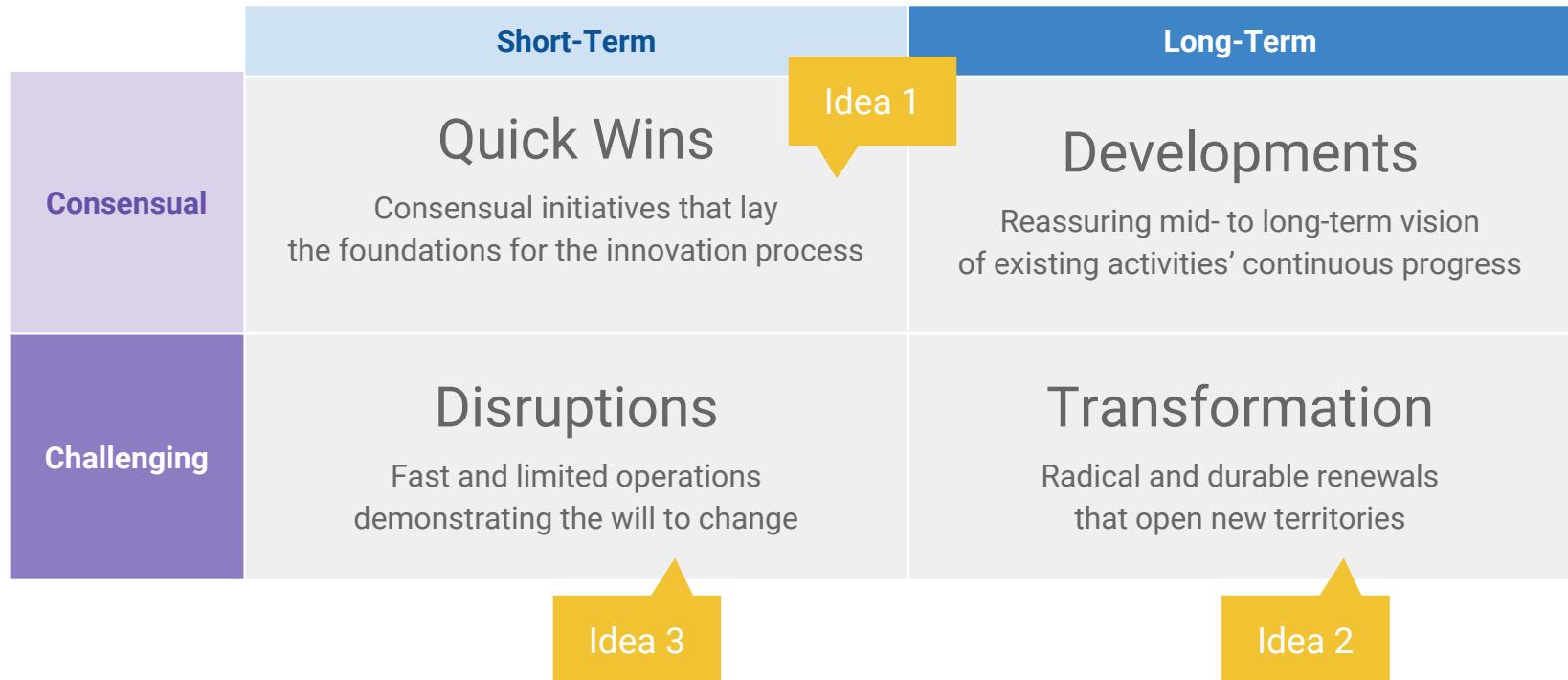
Confront your ideas (after discussion)



Vote in silence



Categorize your ideas





Improves natural language processing of customer service claims

Ocado routes emails based on NLP

"Thanks to Google Cloud Platform, Ocado was able to use the power of cloud computing and train our **models in parallel**."

"Hi Ocado,
I love your website. I have children, so it's easier for me to do the shopping online. Many thanks for saving my time!
Regards"

Feedback

Customer is happy

Bringing structure to email using NLP

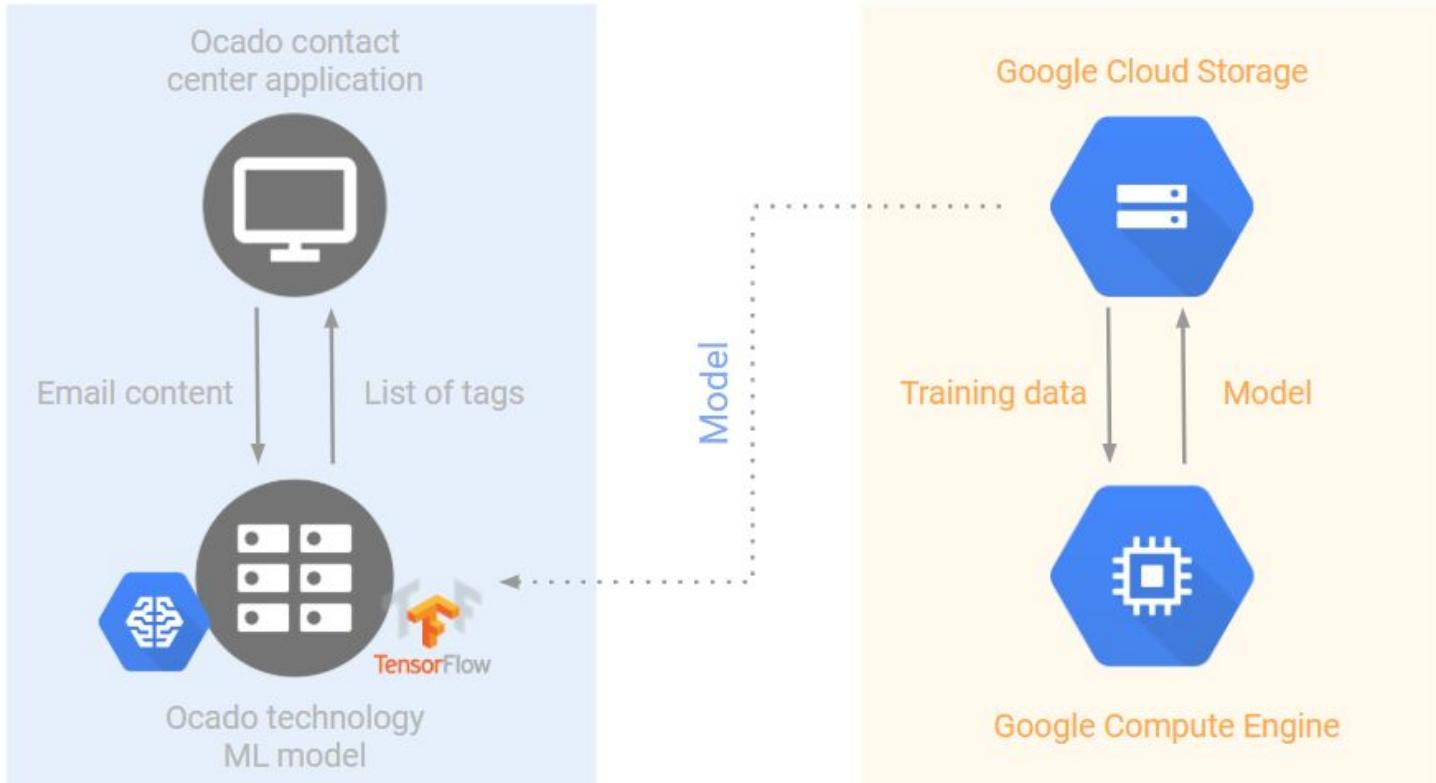
This mail should get tags: →

“Hi Ocado,
I love your website. I have children, so
it's easier for me to do the shopping
online. Many thanks for saving my
time!
Regards”

Feedback

Customer is happy

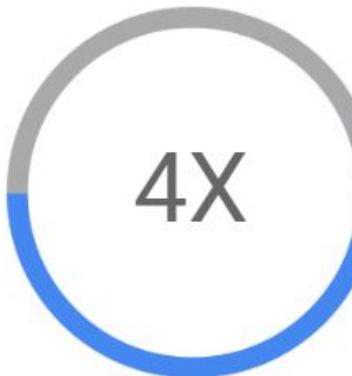
How it works



How does the model work?

- 
- ▶ Model is built with a convolutional neural network
 - ▶ Performance has 0.8 f-measure
 - ▶ Model trained using word2vec

Measuring the impact



*Faster to respond
to urgent emails*



*With minimal system
cost of ~£100 / month*



*FTE salary saved
per month (4 FTEs)*

Data is Everything

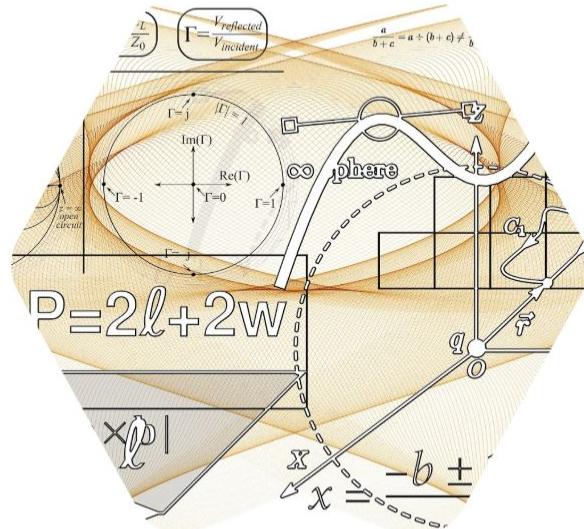
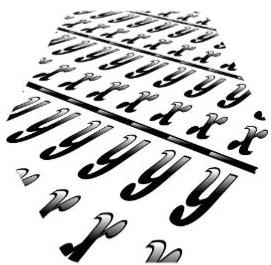
How well you use your data determines the degree of your success

“ It's not who has the best algorithm who wins, it's who has the most data.”

— Andrew Ng , Co-Founder of Google Brain



The popular imagination of what ML is



Lots of data

Complex mathematics in multidimensional spaces

Magical results

In reality ML is....



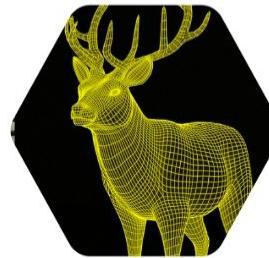
Define
objectives



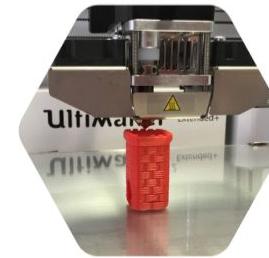
Collect
data



Understand
and prepare
the data



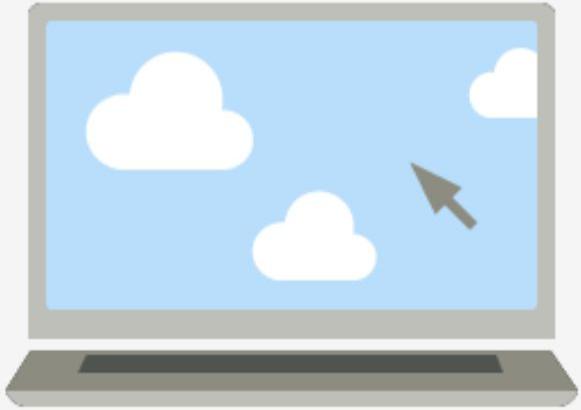
Create and
evaluate the
model



Refine the
model



Serve and
monitor the
model



Demo...

