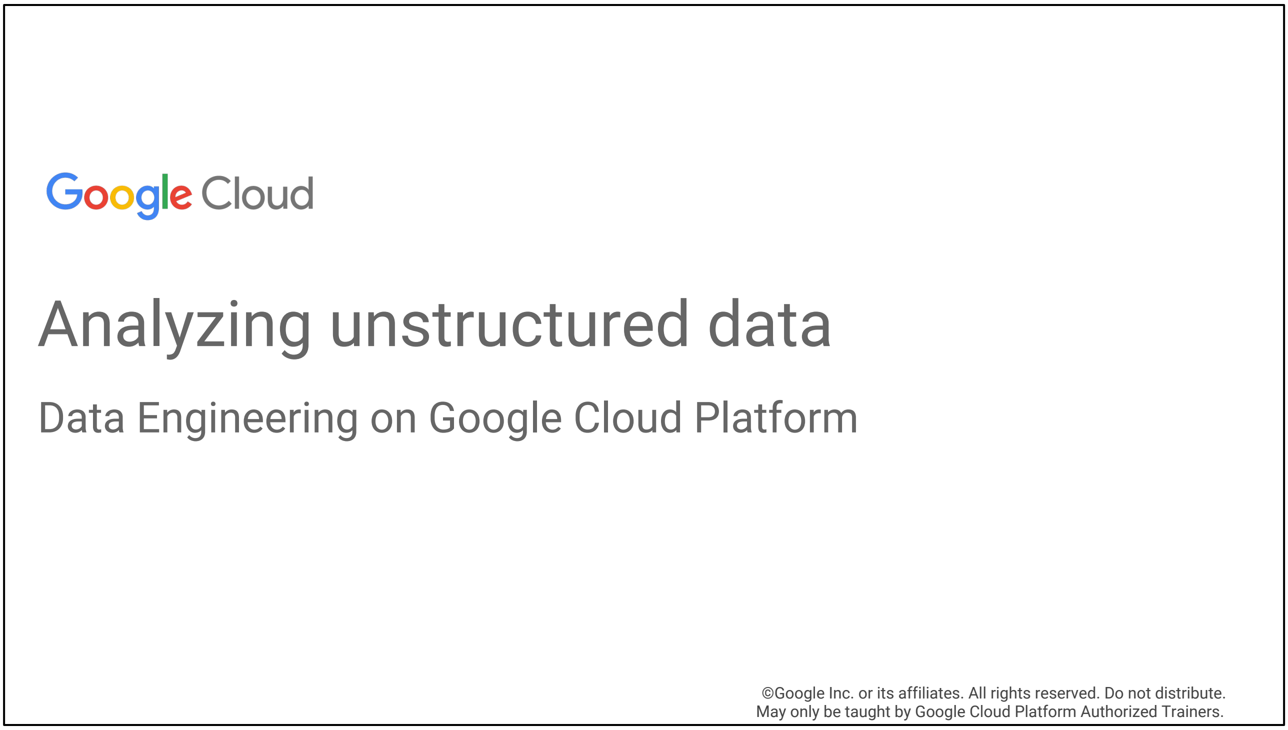


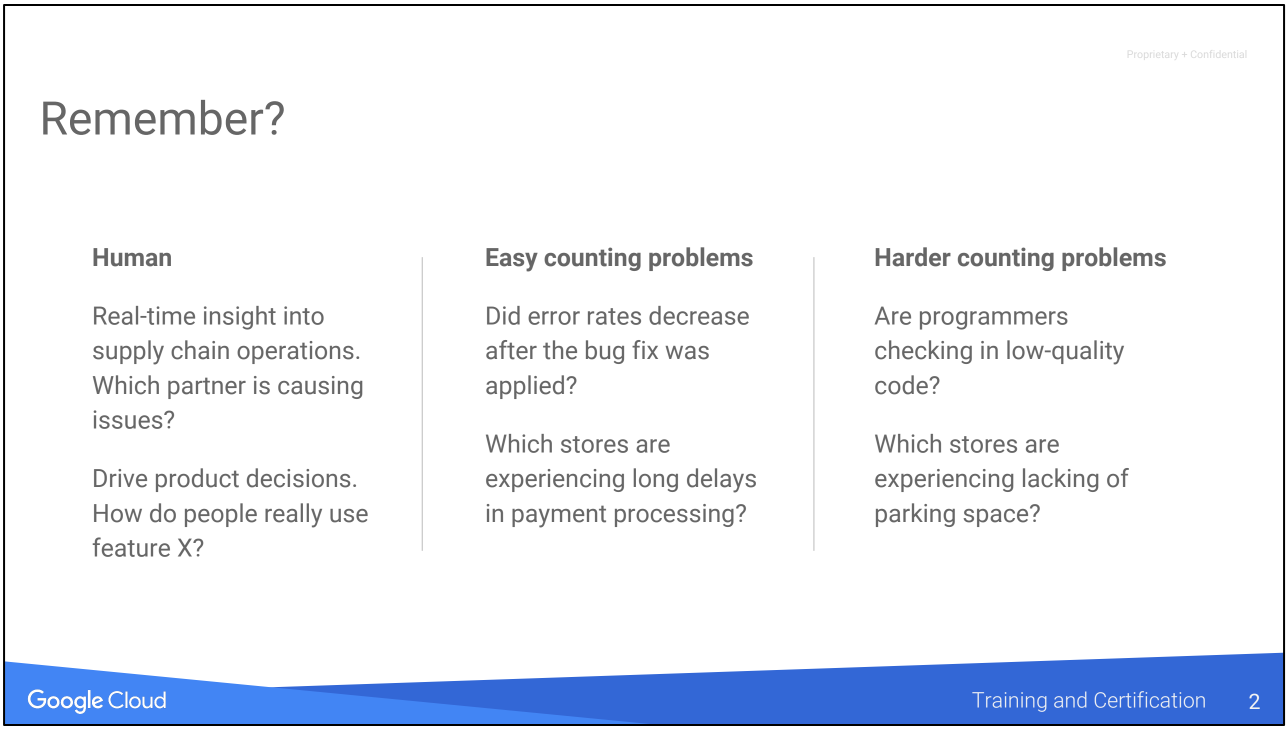
Google Cloud

Analyzing unstructured data

Data Engineering on Google Cloud Platform

Notes:

25 slides + 1 lab: 1 hour



Remember?

Human

Real-time insight into supply chain operations. Which partner is causing issues?

Drive product decisions. How do people really use feature X?

Easy counting problems

Did error rates decrease after the bug fix was applied?

Which stores are experiencing long delays in payment processing?

Harder counting problems

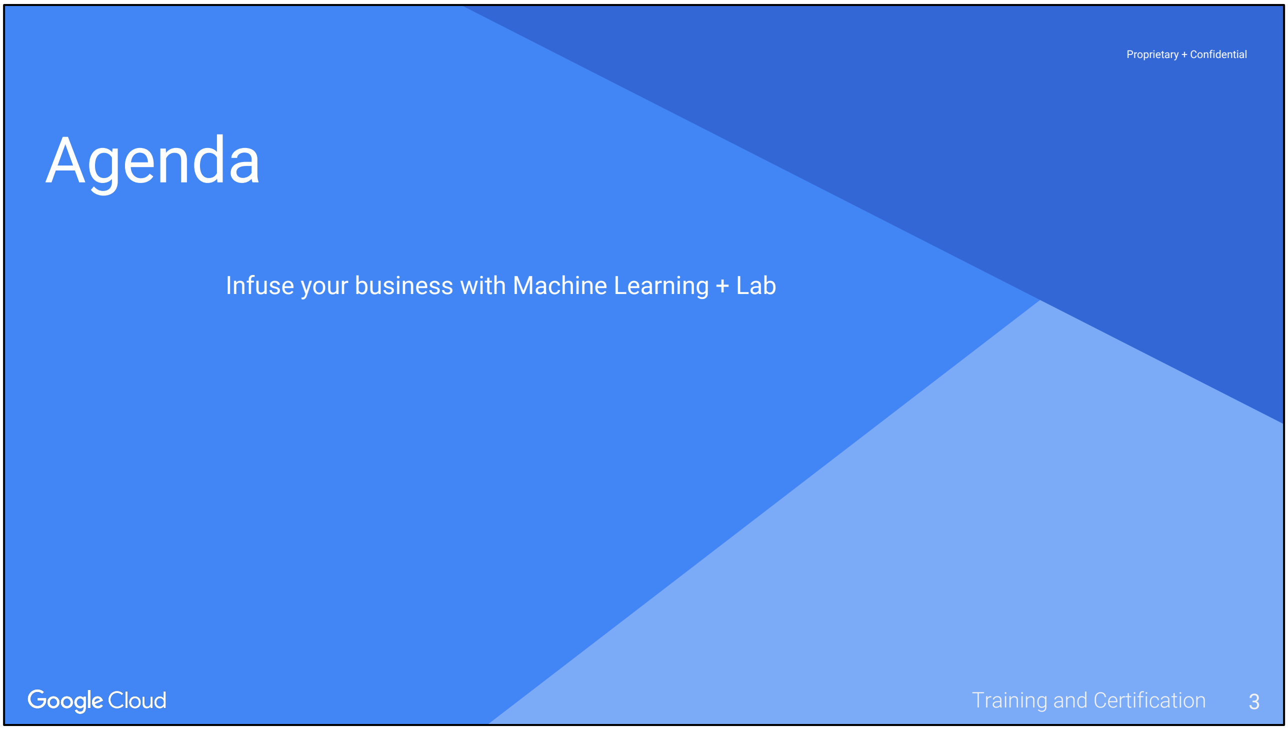
Are programmers checking in low-quality code?

Which stores are experiencing lacking of parking space?

Notes:

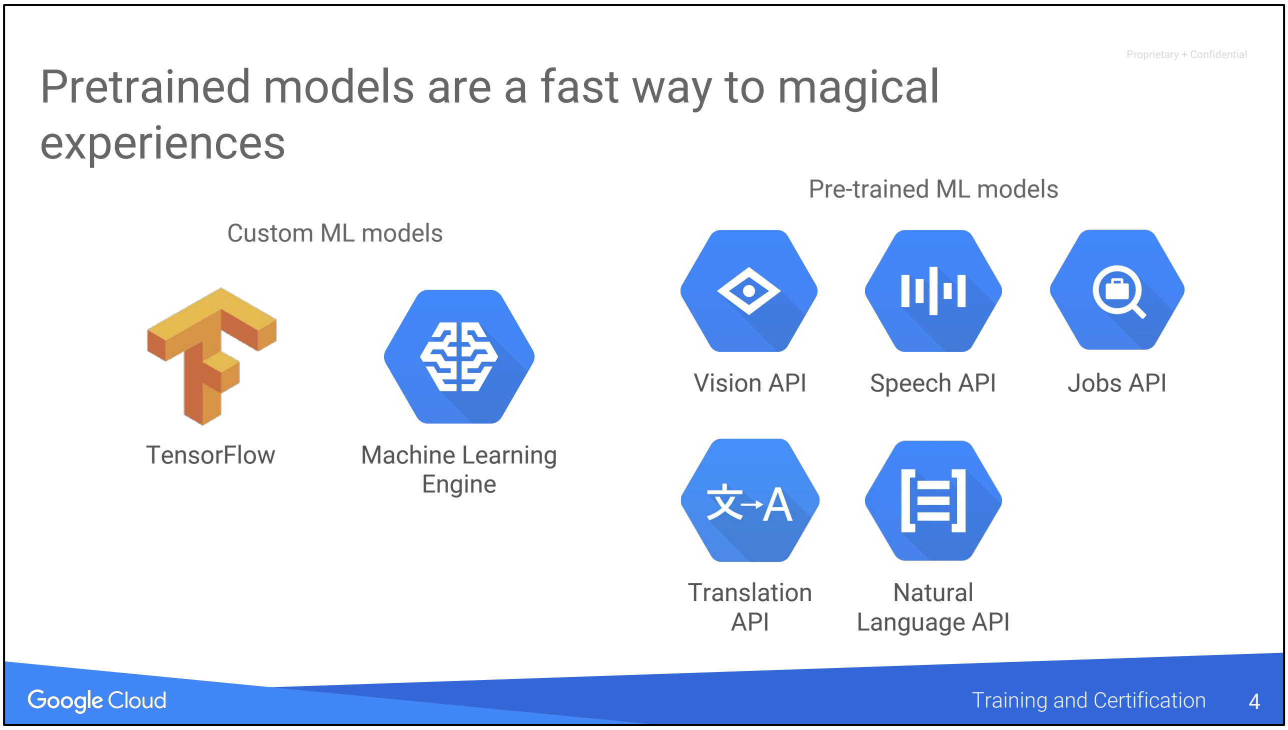
Compare these with the ones on the previous slide. Structured vs. unstructured.

Low-quality could be determined by bad sentiment in code reviews and often through programmer’s own negative comments in the code. They are checking in the code because they need to move on to their next project …. But there are also tools out there that will look for code-smells. Those tools can be run at scale on Dataproc.



Agenda

Infuse your business with Machine Learning + Lab



Pretrained models are a fast way to magical experiences

Custom ML models

- TensorFlow
- Machine Learning Engine

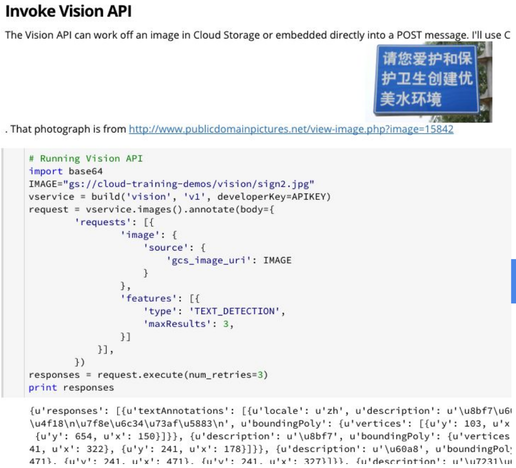
Pre-trained ML models

- Vision API
- Speech API
- Jobs API
- Translation API
- Natural Language API

Notes:

We’ll look at TF & MLE next. But right now, let’s talk about pre-trained ML models.

ML APIs are accessed through REST APIs -- no machine learning knowledge required



Invoke Vision API

The Vision API can work off an image in Cloud Storage or embedded directly into a POST message. I'll use C

. That photograph is from http://www.publicdomainpictures.net/view-image.php?image=15842

```
# Running Vision API
import base64
IMAGE="gs://cloud-training-demos/vision/sign2.jpg"
vservice = build('vision', 'v1', developerKey=APIKEY)
request = vservice.images().annotate(body={
        'requests': [{
                'image': {
                    'source': {
                        'gcs_image_uri': IMAGE
                    }
                },
                'features': [{
                    'type': 'TEXT_DETECTION',
                    'maxResults': 3,
                }]
            }],
        })
responses = request.execute(num_retries=3)
print responses
```

```
{u'responses': [{u'textAnnotations': [{u'locale': u'zh', u'description': u'\u8bf7\u6
\u4f18\n\u7f8e\u6c34\u73af\u5883\n', u'boundingPoly': {u'vertices': [{u'y': 103, u'x
 {u'y': 654, u'x': 150}]}}, {u'description': u'\u8bf7', u'boundingPoly': {u'vertices
41, u'x': 322}, {u'y': 241, u'x': 178}]}}, {u'description': u'\u60a8', u'boundingPol
471}, {u'y': 241, u'x': 471}, {u'y': 241, u'x': 327}]}}, {u'description': u'\u7231\u
```

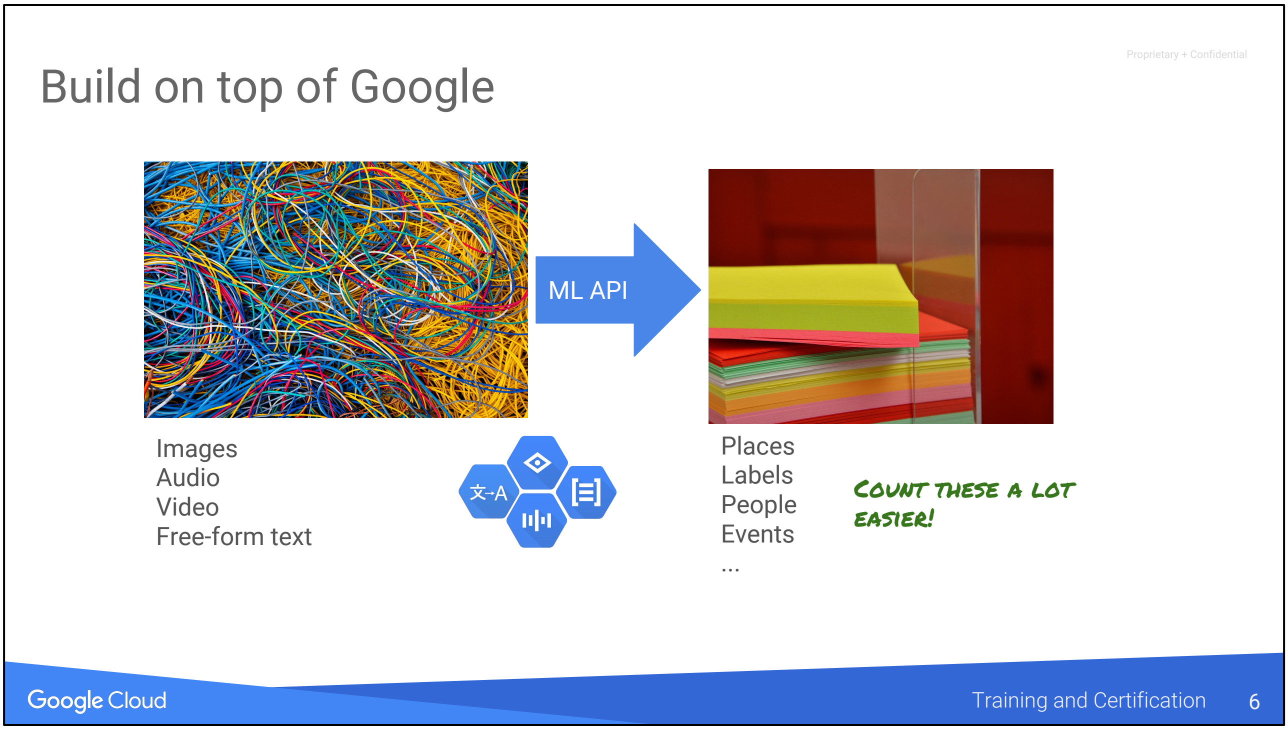
Image (GCS/embedded)

JSON request

JSON response

Notes:

This was a lab in the fundamentals course. They've done this already.



Build on top of Google

Images
Audio
Video
Free-form text

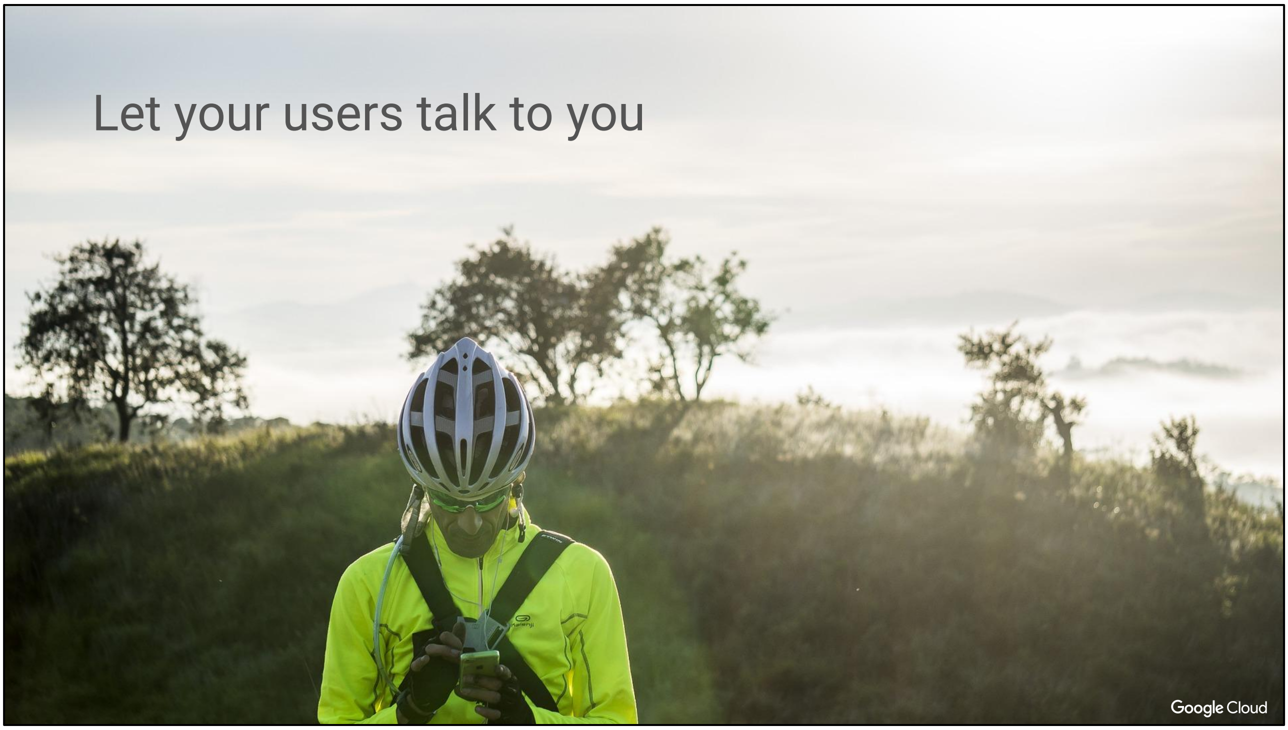
ML API

Places
Labels
People
Events
...

COUNT THESE A LOT EASIER!

Notes:

https://pixabay.com/en/list-zettelbox-note-leaves-stack-1925395/ (cc0)



Let your users talk to you

Notes:

https://pixabay.com/en/cycling-bike-trail-sport-sol-1533268/ (cc0)
idea : voice-enable your applications

Use Speech API

Just a REST call, so easy to incorporate

Voice-navigation?

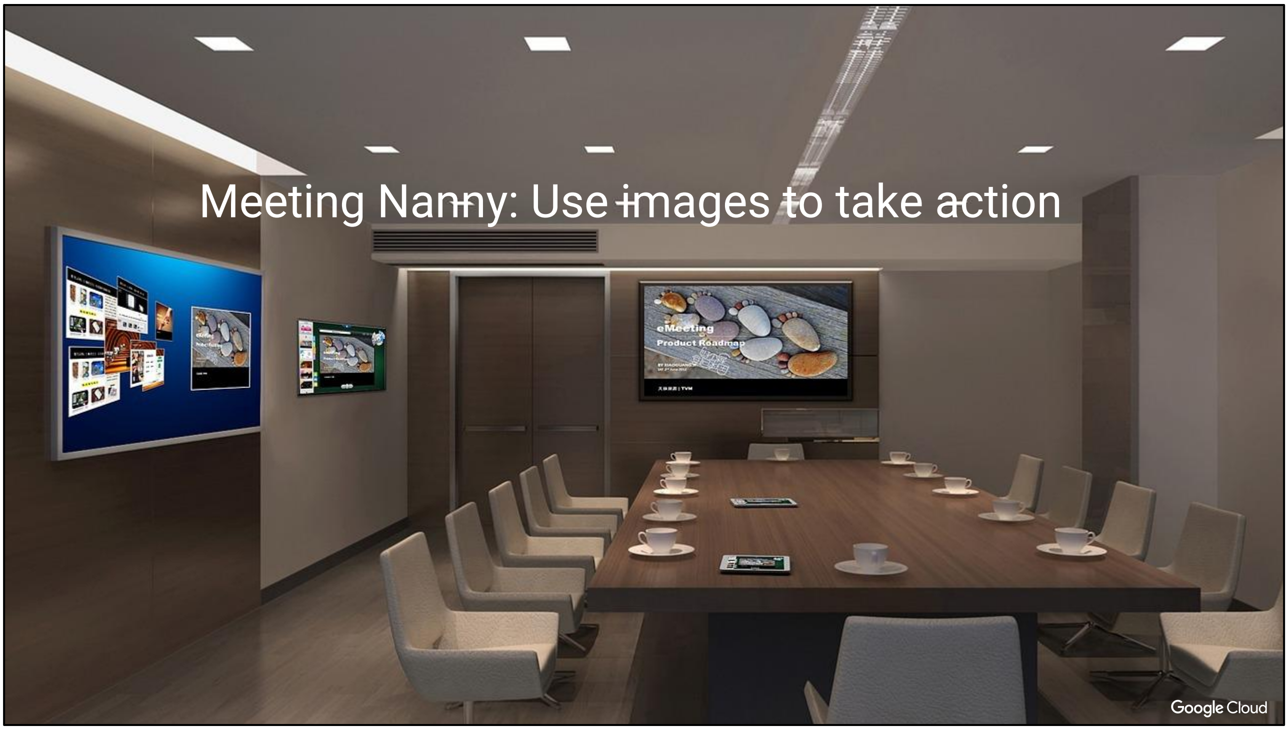
Know your user/from their app/anticipate their need/carry on conversation = ASSISTANT story

Go from speech to action with bots

https://api.ai/

Notes:

Sign up for a demo on api.ai if you want to try it out yourself.



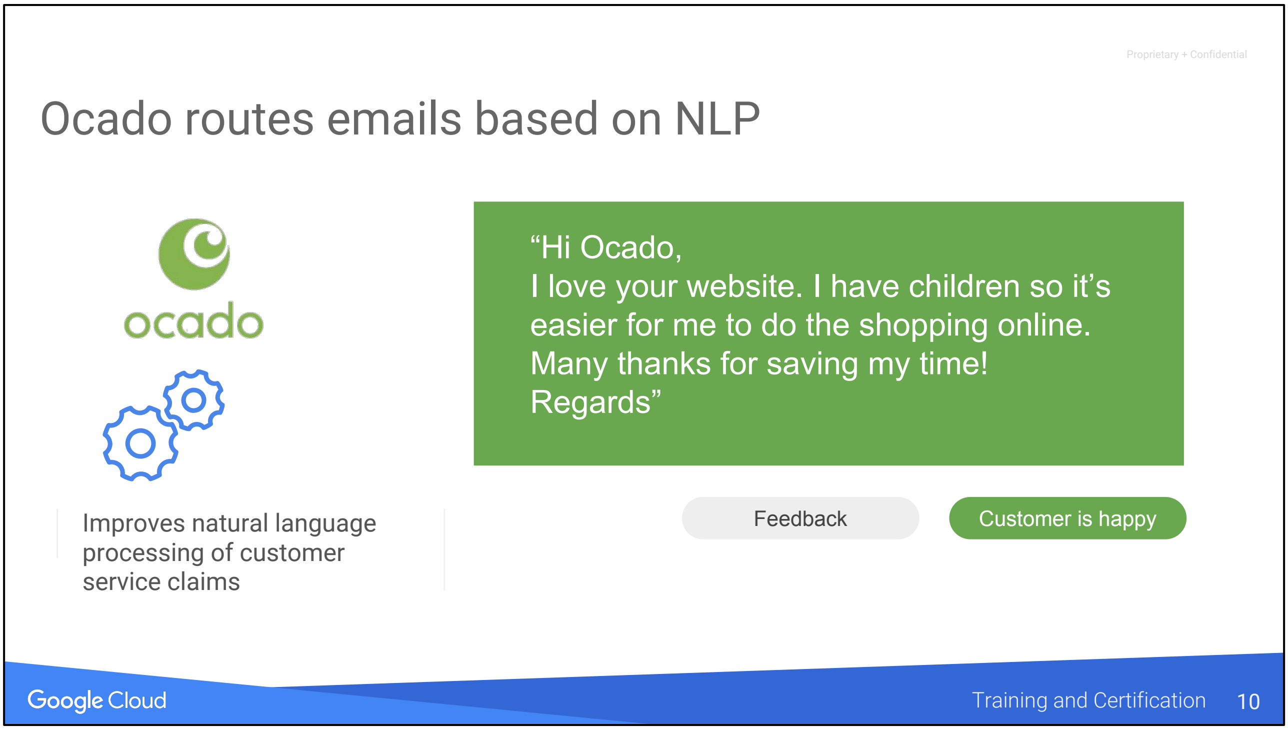
Meeting Nanny: Use images to take action

Notes:

Image from https://pixabay.com/en/interior-design-tv-multi-screen-828545/ (cc0)

From: https://g3doc.corp.google.com/java/com/google/corp/bizapps/rews/spacesaver/g3doc/gvc.md?cl=head

We do occupancy detection via motion detection (by the VC camera) and by call ID matching. Every 30 seconds, the VC unit sends a Pubsub notification whether motion was detected or not. It also sends a Pubsub notification when a call started or ended together with whether the call ID matched the meeting ID.
If motion is detected between 6 and 8 minutes after the meeting start time, the room counts as occupied. Otherwise, it's empty.



Ocado routes emails based on NLP

ocado

Improves natural language processing of customer service claims

“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

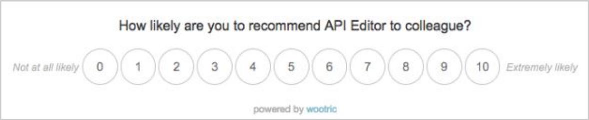
Customer is happy

Notes:

- World’s largest online only grocery supermarket
- Goal for best customer service
- Customers call or email their contact center (Social media, landline, email, SMS)
- Types: General feedback, refunds, redeliver, payment issues
- No forms or self categorization…all emails in a central mailbox
- Traditionally, each email gets addressed and routed. Can’t scale, longer delays, poor experience
- Sifting through email is a repetitive task
- Ocado Technology w/ 1000+ developers, engineers, data scientists
- Used Natural Language processing: combines computer science, artificial intelligence, and computational linguistics
- Parse through the body of emails, tags and routes to help contact center reps determine the priority and context

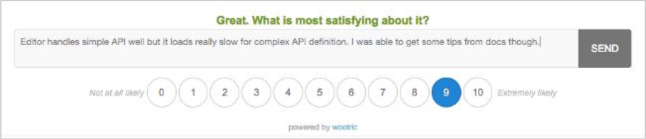
Wootric collects both numeric and qualitative feedback

WOOTRIC



How likely are you to recommend API Editor to colleague?

EASY TO COMPUTE NET PROMOTER SCORE

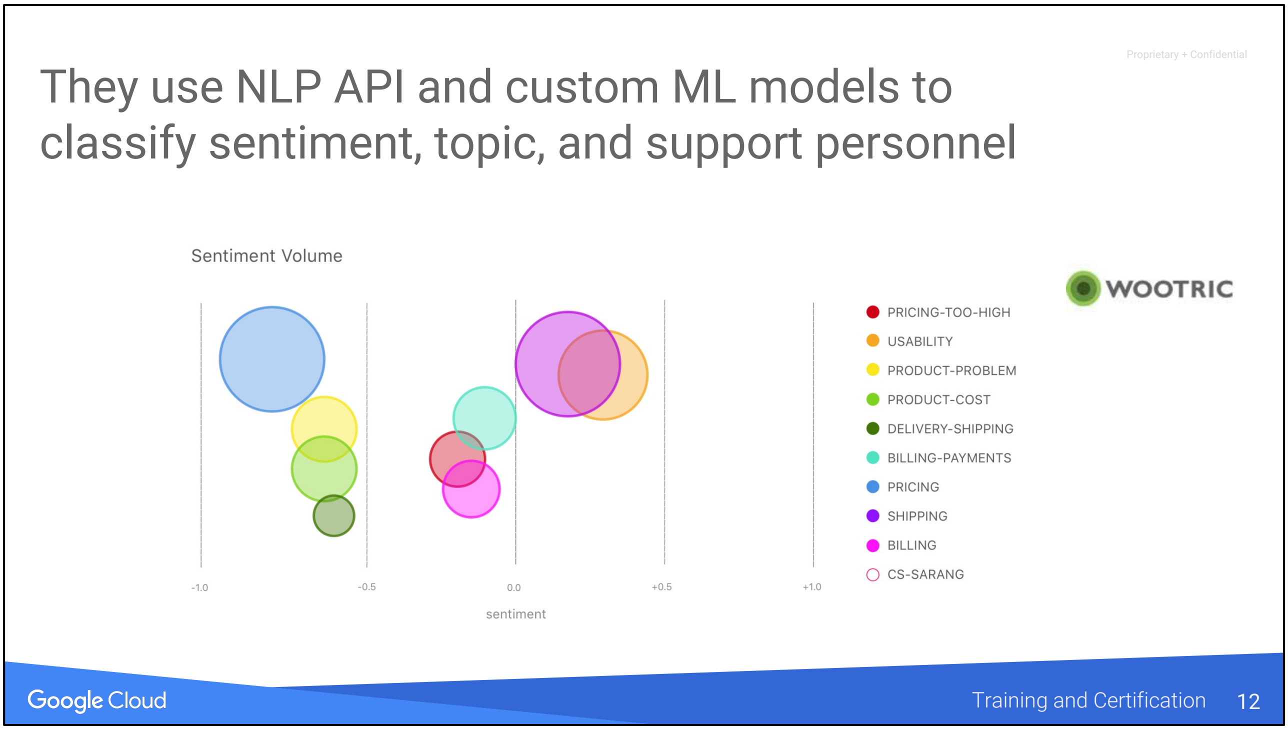


Great. What is most satisfying about it?

Editor handles simple API well but it loads really slow for complex API definition. I was able to get some tips from docs though.|

FREE FORM TEXT -- NOT AS EASY TO HANDLE

https://cloud.google.com/blog/big-data/2017/03/analyzing-customer-feedback-using-machine-learning

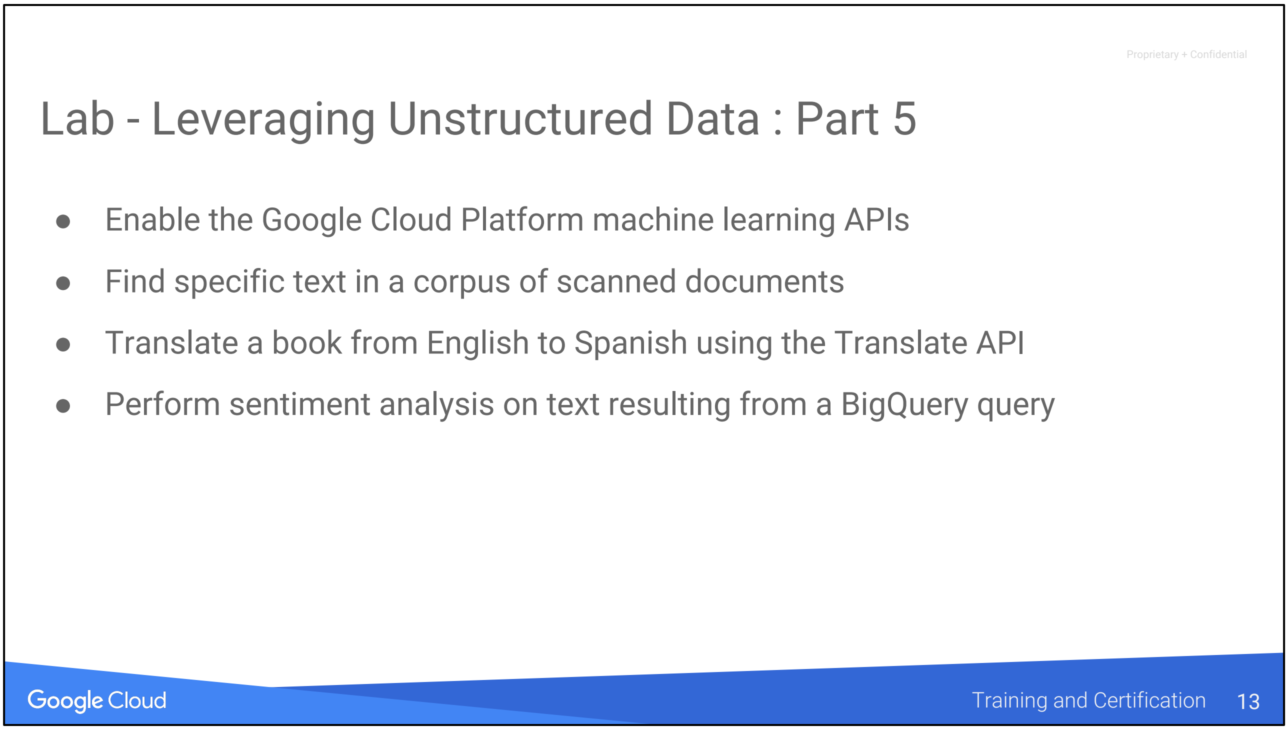


Proprietary + Confidential

They use NLP API and custom ML models to classify sentiment, topic, and support personnel

Notes:

Support personnel is not shown, but the idea is that if the feedback mentions “jessica”, they know who is being talked about.



Lab - Leveraging Unstructured Data : Part 5

- Enable the Google Cloud Platform machine learning APIs
- Find specific text in a corpus of scanned documents
- Translate a book from English to Spanish using the Translate API
- Perform sentiment analysis on text resulting from a BigQuery query

cloud.google.com

Images by Connie Zhou