MLAI220:
Customer Stories: leveraging pre-trained and custom machine learning models

Google Cloud

Speakers

Dave Elliott, AI for Developers, Google Cloud

Dewayne Whitfield, Technology Innovation and Product Strategist, USPS

Dr. Xin Liu,Technical Director, Precise Software Solution

Jack Smyth, Head of Innovation, Mindshare

Chris Pocock, Head of Marketing, Fox Sports Australia

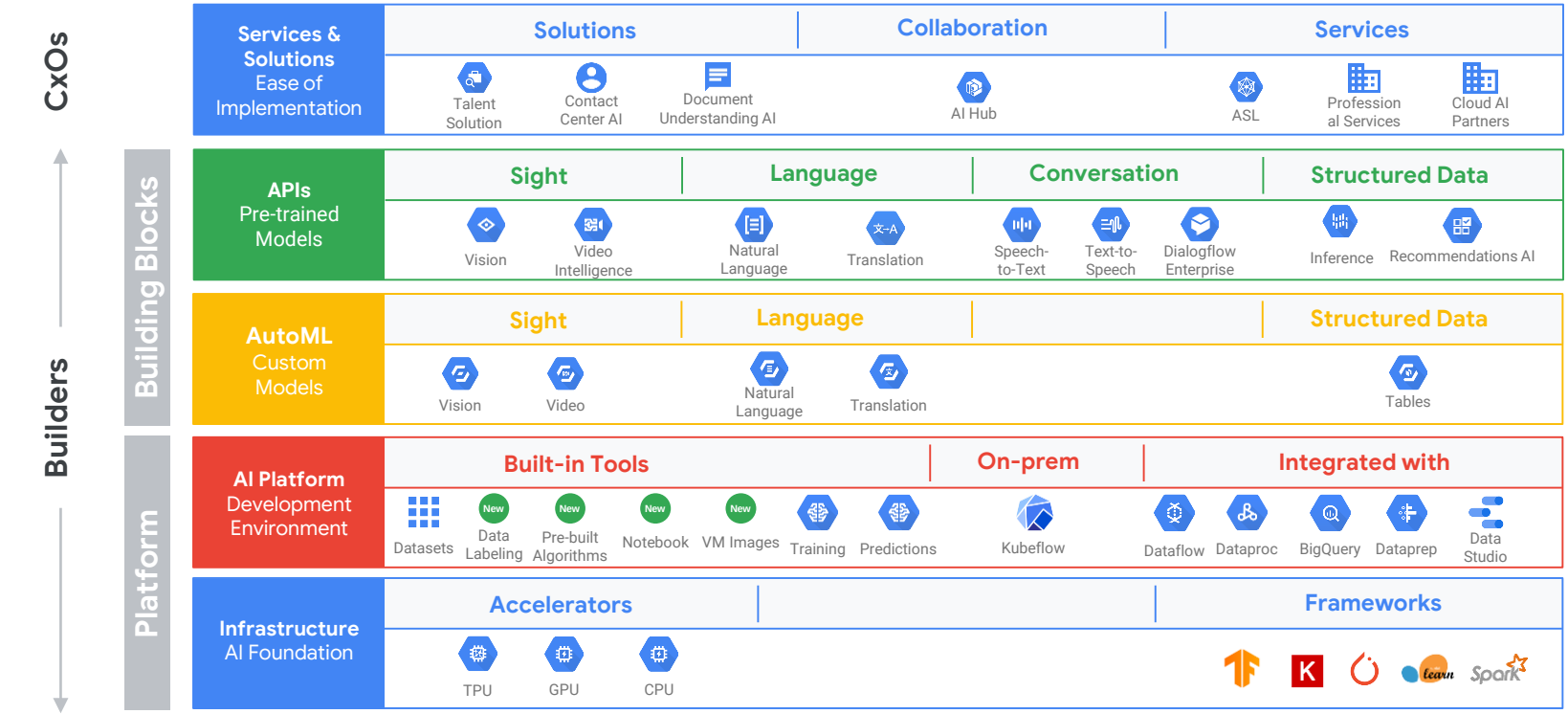
AI building blocks

Google Cloud

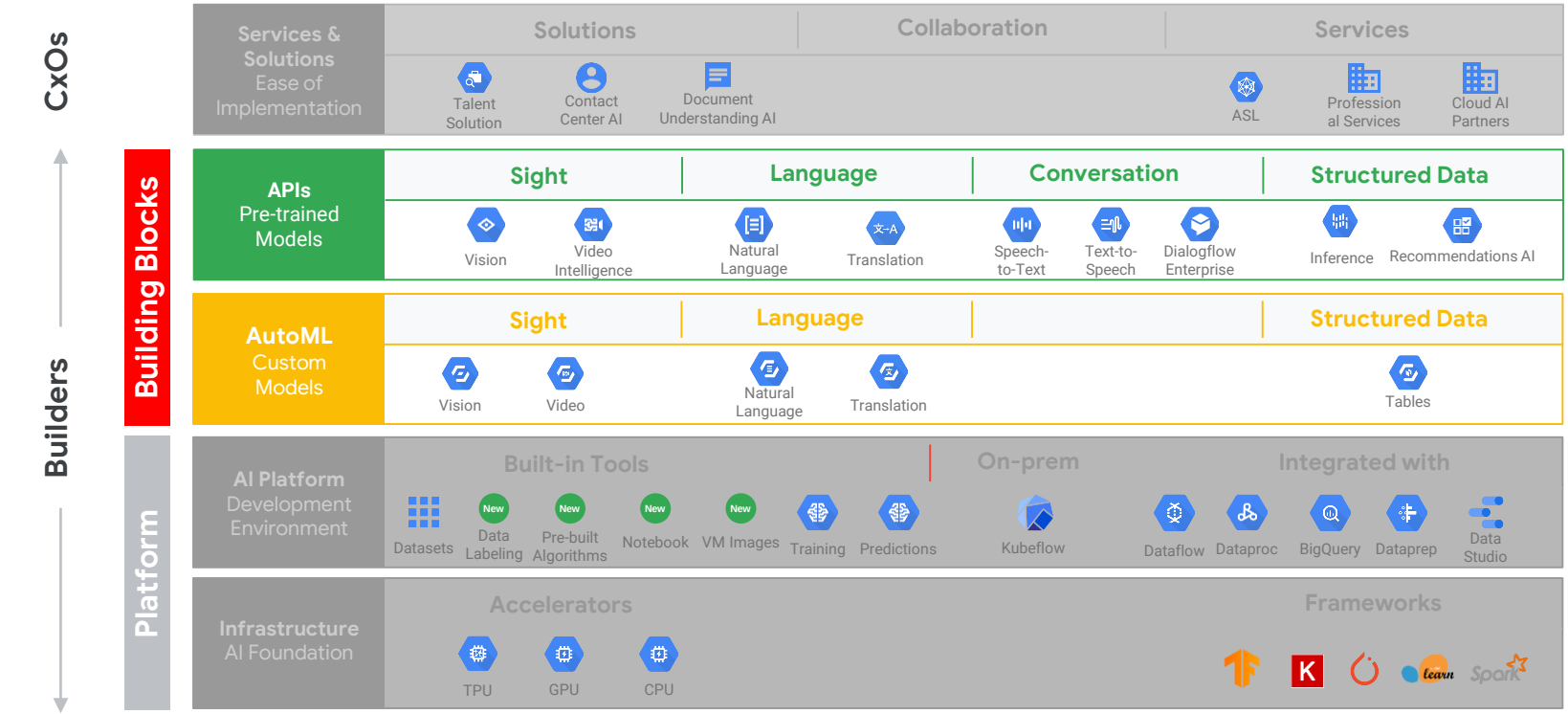
Who can actually use AI today?

Very few people can create truly custom ML models today

Google Cloud



Google Cloud



Google Cloud

Building Blocks - Use Cases

Dialogflow Enterprise

AutoML Tables

AutoML Vision

Pill Recognition Using AutoML

Xin Liu M.D./M.S., Technical Director, Solution Architect, Precise Software Solutions

Google Cloud

Prescription Drug Challenges

187M
Americans use prescription drugs

58%
Americans on at least one drug

110M
Prescriptions per year that are never picked up

50%
Don’t take medicines as prescribed

125K
Americans die every year as a result

PillSafe

1. Medication **Management**
2. Drug Recall, Blackbox, Interaction and Dosage **Alert**
3. **Adverse Event** Reporting
4. **Clinical Trial**, **Generic drug** and **Therapeutic group** Information
5. **Social Media** for **Epidemic** awareness

Google Cloud

Pill Recognition

1. Identify drug name by **taking pictures** of the pill
2. Identify drug which is not in the **personal drug list**
3. Provide **drug information** such as dosage and drug interaction
4. Replenish NIH drug **image library**

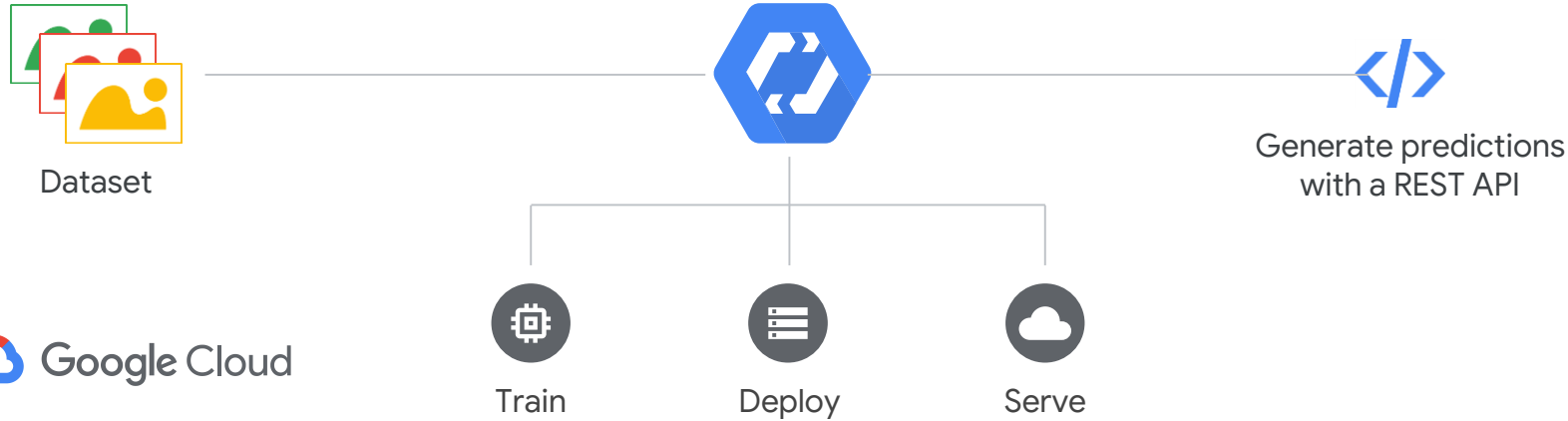
Google Cloud

AutoML Products Used

AutoML Vision
Derive insights from images in the cloud or at the edge

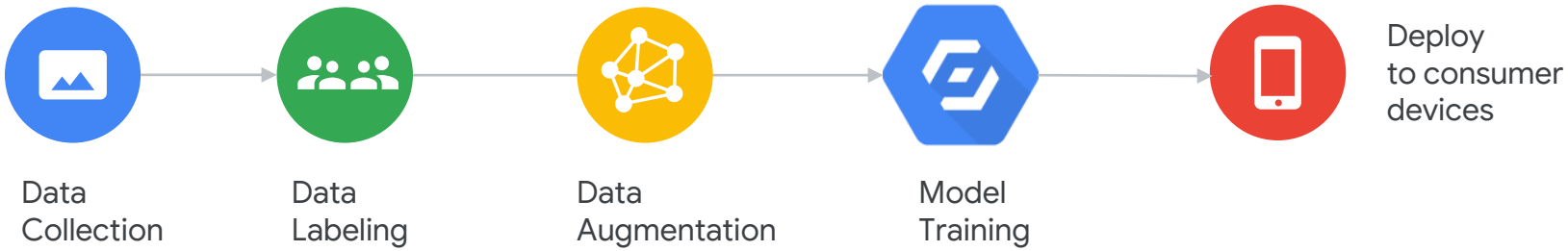
AutoML Natural Language
Reveal the structure and meaning of text through machine learning

AutoML Translation
Dynamically detect and translate between languages



Google Cloud

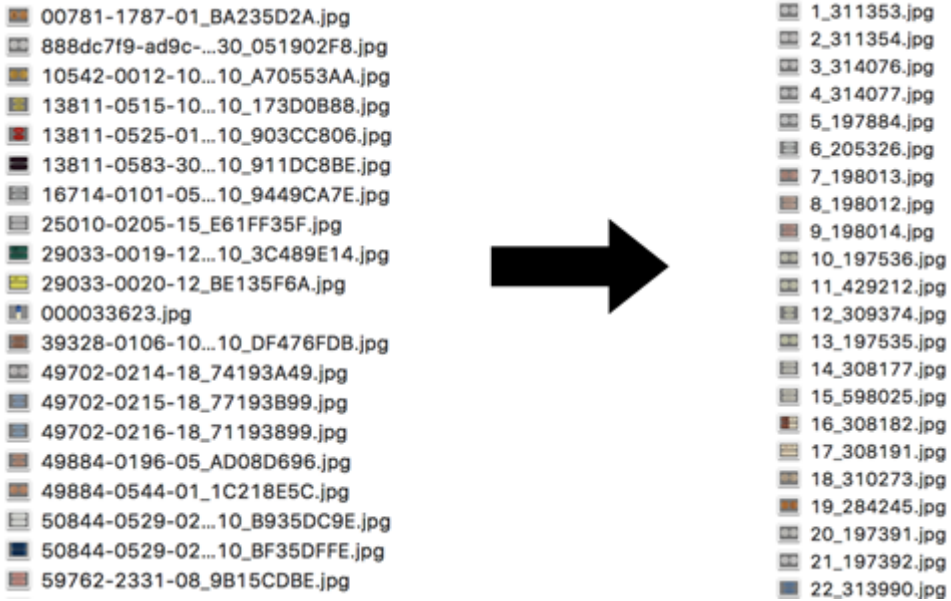
AutoML Vision Process for Model Training



Google Cloud

Image Relabeling

Regular expression (Re) is applied to convert the filename to a **standardized format**. Each new image file were named by “index_rxcui” format.



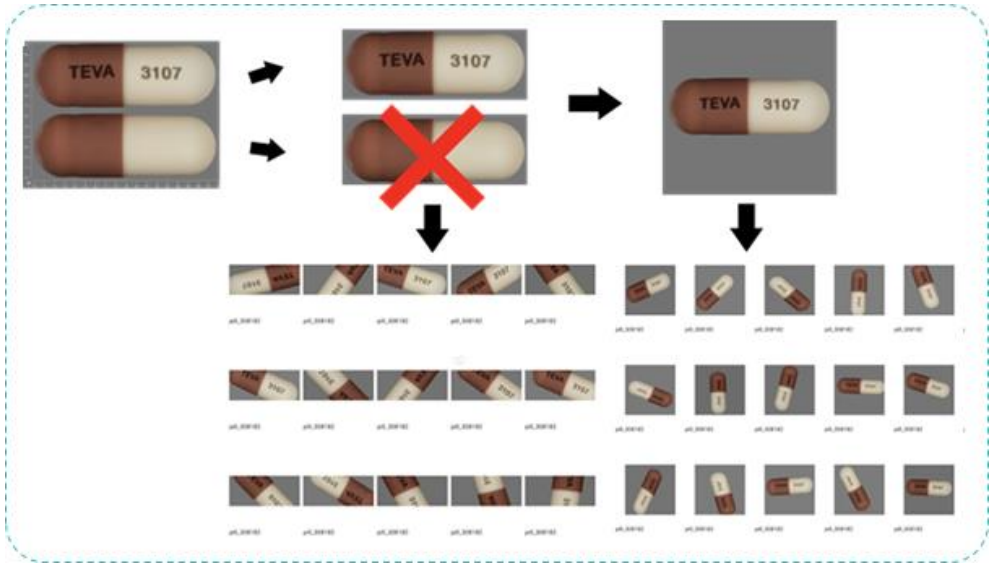
RxNorm concept unique identifier (RXCUI): This RXCUI always designates the same concept, no matter the form of the name and no matter in what table it is found. Drugs whose names map to the same RXCUI are taken to be the same drug - identical as to ingredients, strengths, and dose forms. Conversely, drugs that differ in any of these particulars are conceptually distinct and will have different RXCUIs. *https://ushik.ahrq.gov/ViewItemDetails?system=ps&itemKey=169183000*

Google Cloud

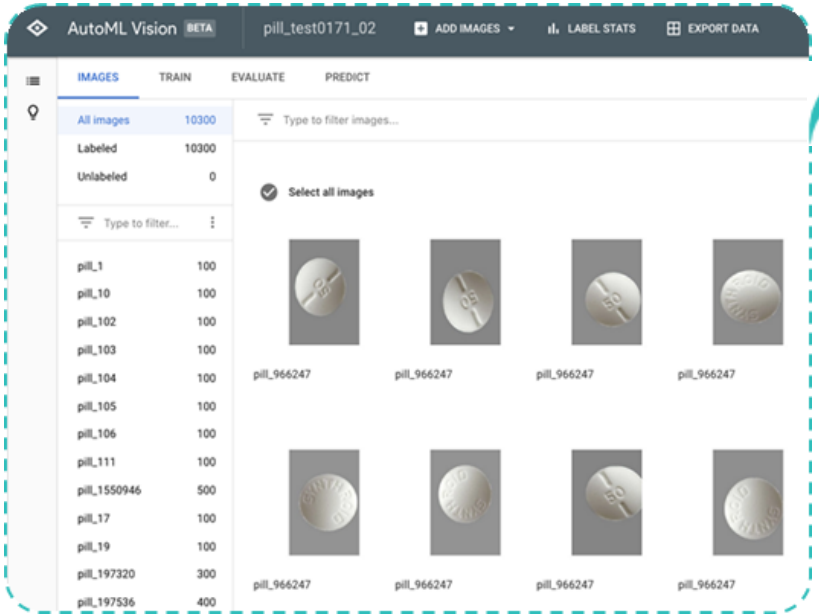
Image Augmentation

Image augmentation helps to **generate more training data** based on original image data. It includes three transformations:

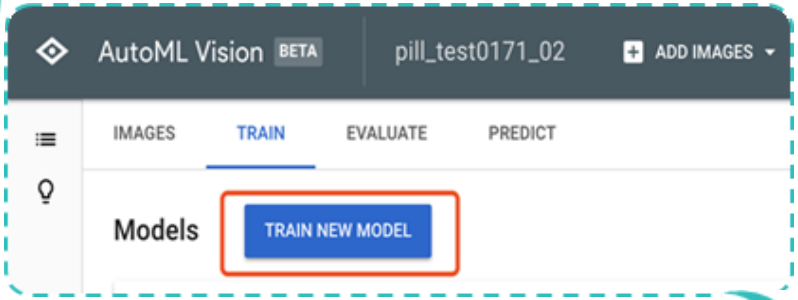
- Cropping the image
- Rotating the image
- Zooming in and out on the image



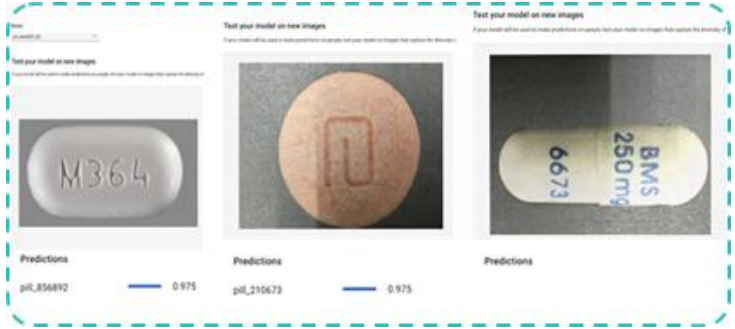
Google Cloud



Step 1: Prepare Images



Step 2: Train Model



Step 3: Predict

Google Cloud

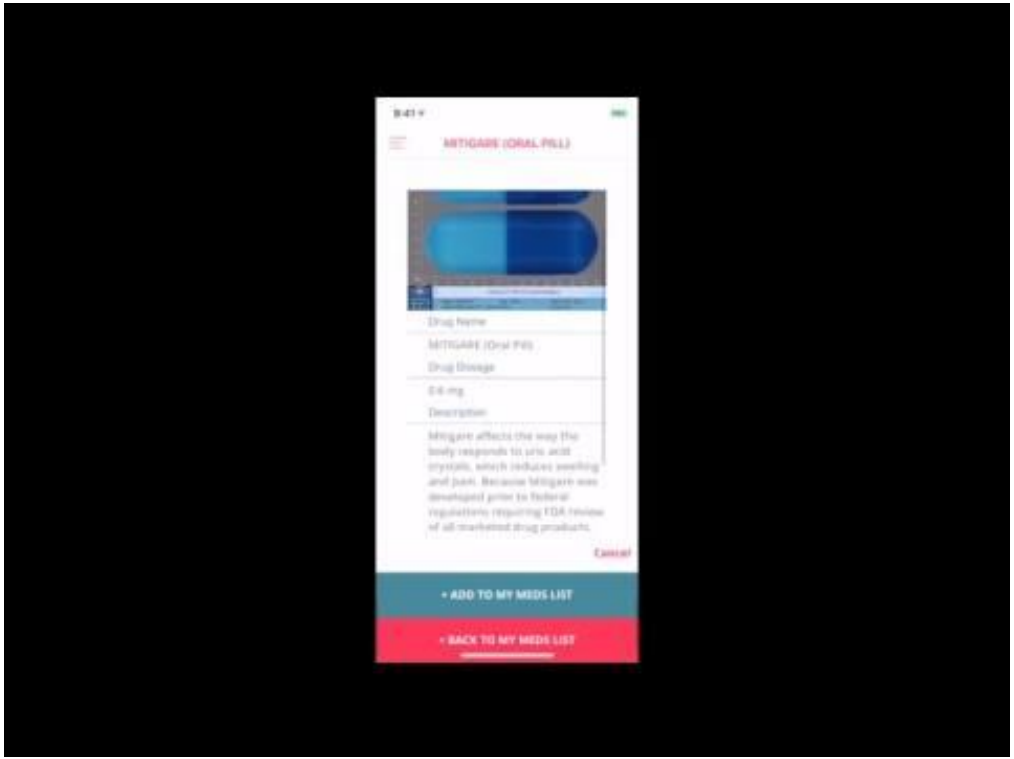
Pill Safe Using AutoML Vision

Key User Activities

- Take photo and automatically identify pill
- Get information about medication (dosage, description, warnings etc)
- Add to regular medication schedule

Google Cloud

Pill Safe Mobile App Demo



Pill Safe & AutoML in the Future

1. Extend **NLP** capability for data analytics on unstructured data on drugs
2. **Label mining** to correlate symptoms, drug dosage and adverse event
3. Drug information **translation** to different language
4. Extend pill recognition capability from single pill to **multiple pills**
5. Replenish NIH drug image library and create a **generic drug image dataset**

AutoML Vision

AutoML Natural Language

AutoML Translation

Google Cloud