

# Practical Applications of Machine Learning for Image and Video in the Cloud

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*There were 3.7 Billion internet users in 2017*  
*1.2 Trillion photos were taken in 2017 (9% YoY Growth)*  
*50% of 2016 internet traffic was video, and will likely be 70% by 2021*  
*Multi-petabyte asset storage with >1PB MoM growth is commonplace on AWS*

Sources: \* InfoTrends Worldwide, \*\* StreamingMedia.com

# Can AI add value to our content and services?



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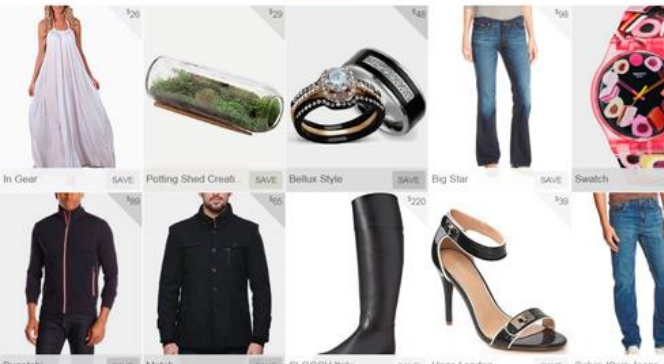
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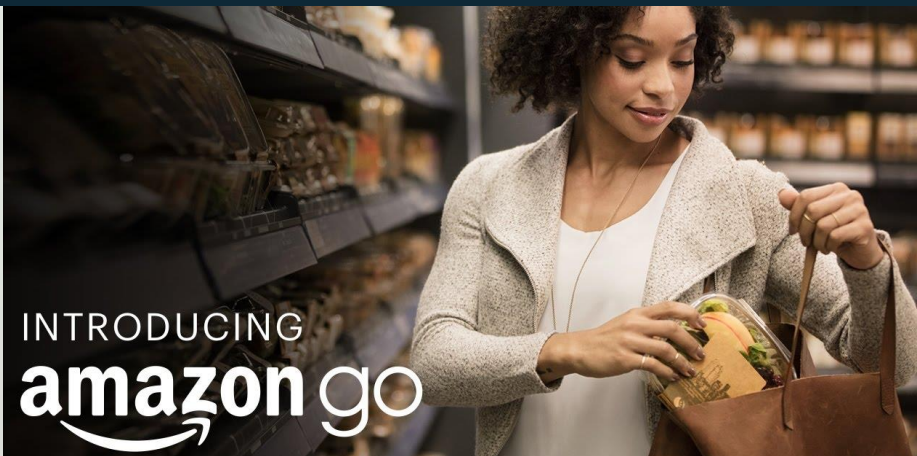
# Artificial Intelligence at Amazon in 1995

Beautiful things, updated daily

ALL WOMEN MEN YOUR SAVES



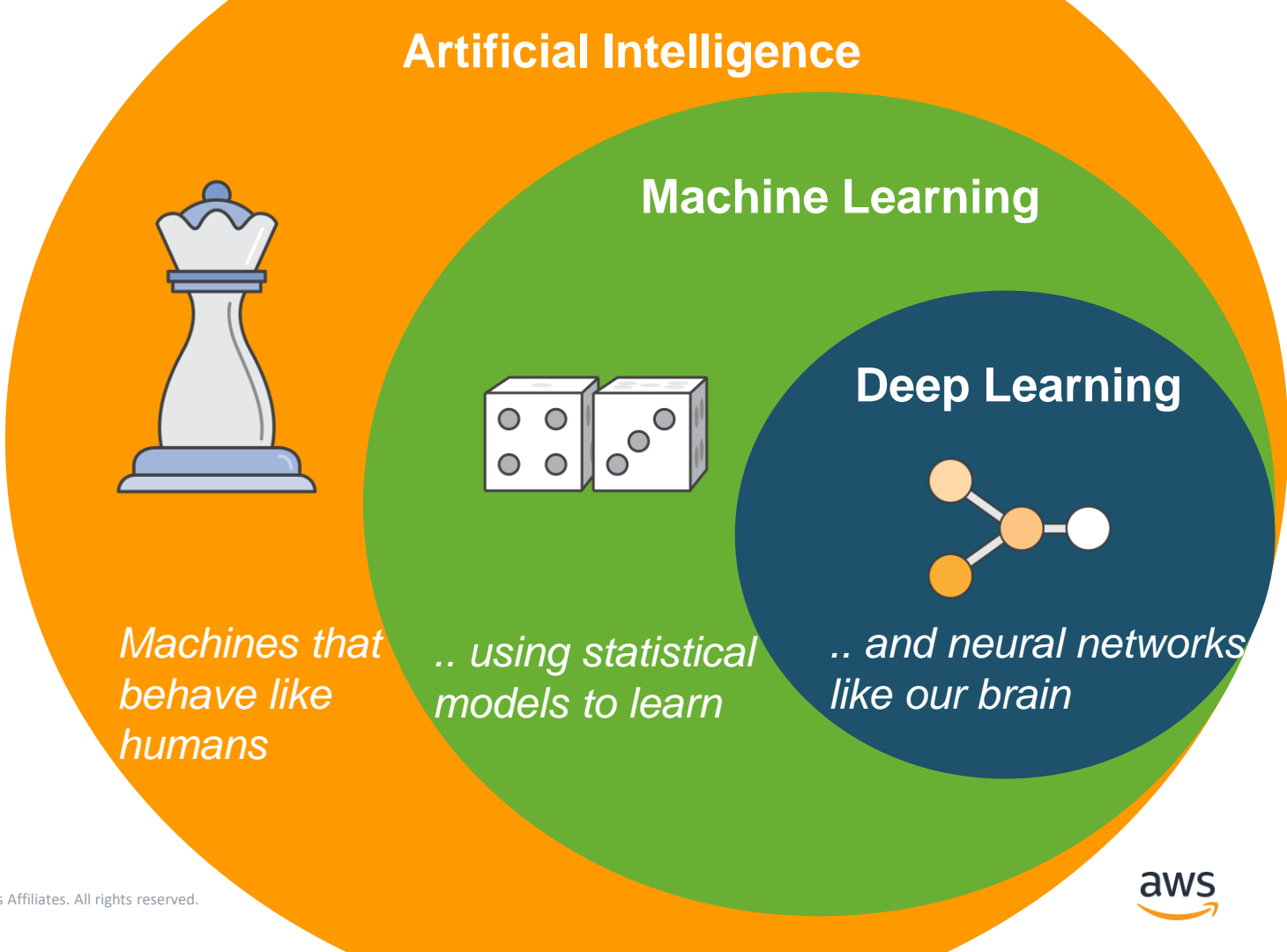
# Artificial Intelligence at Amazon



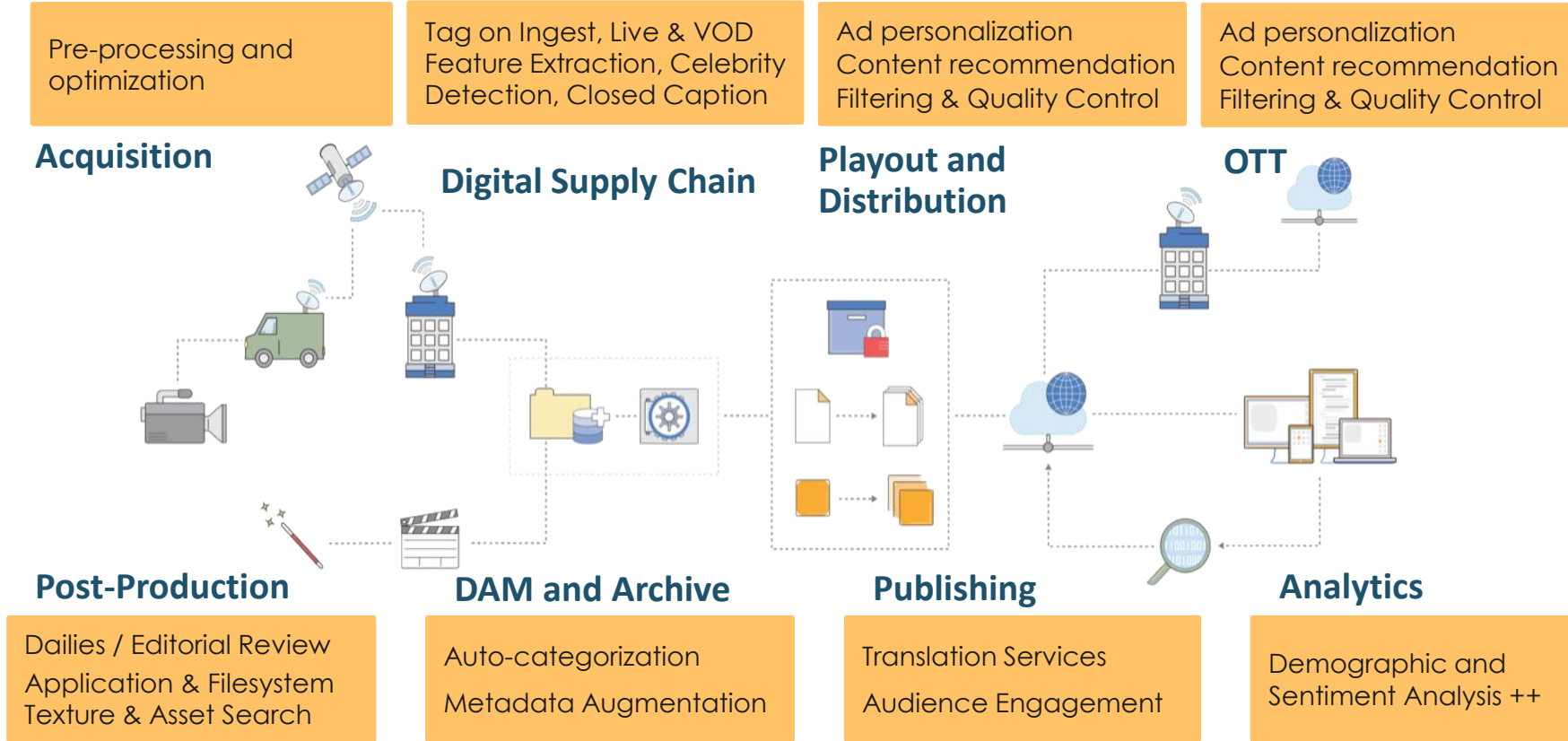
INTRODUCING  
**amazon go**



# What is AI/ML/DL?

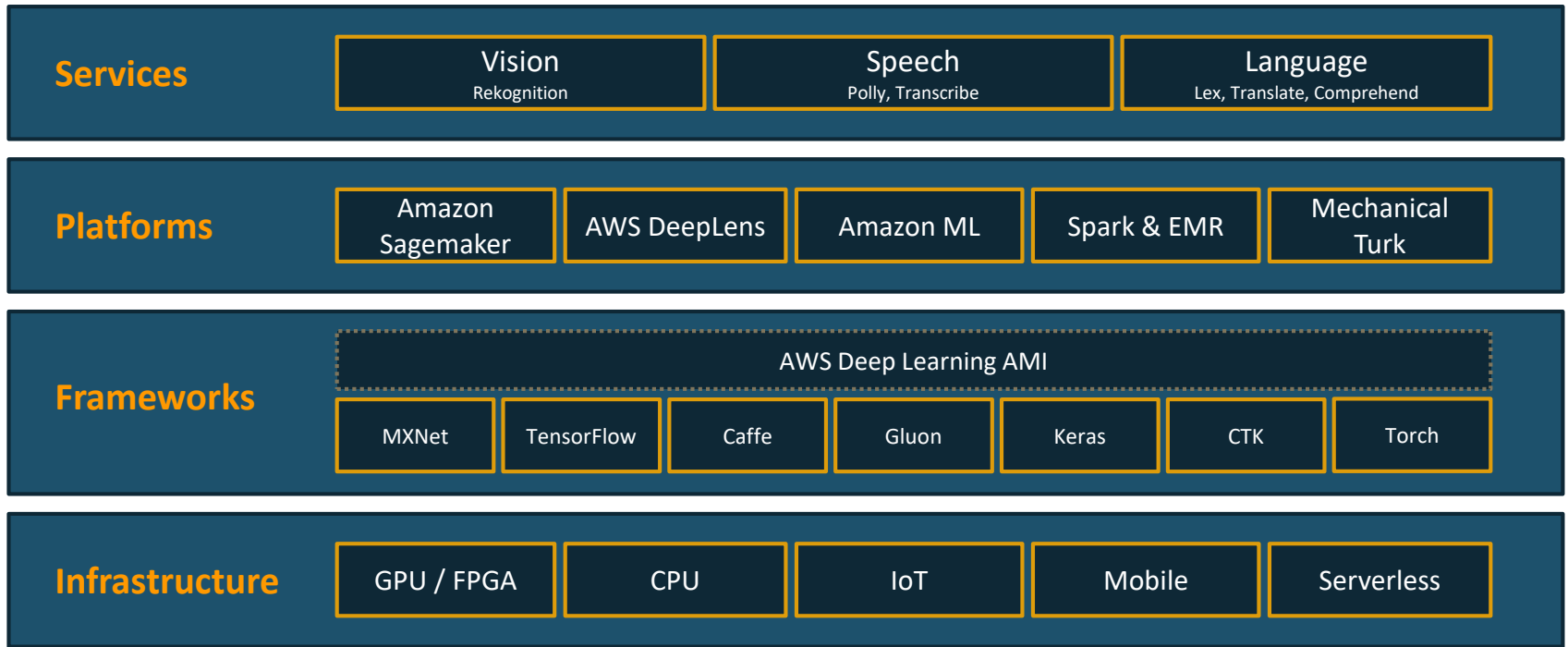


# AI across the Media Value Chain



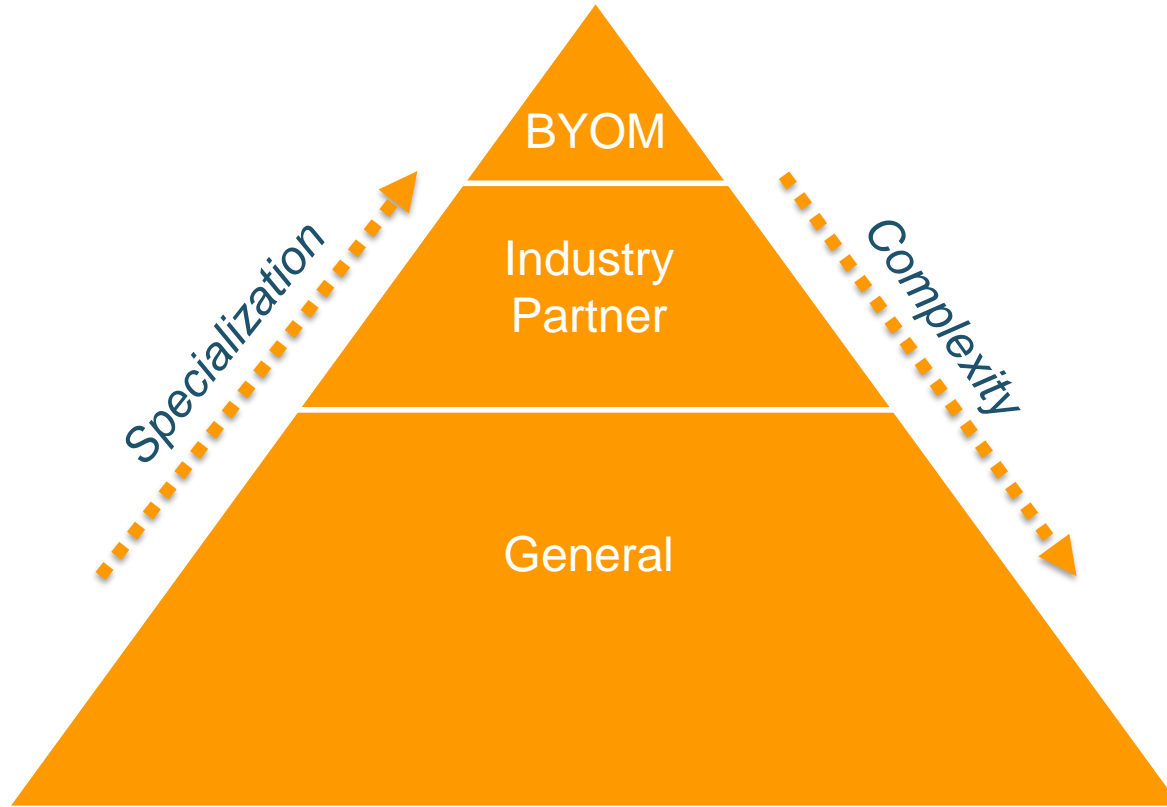


# The Amazon AI Stack

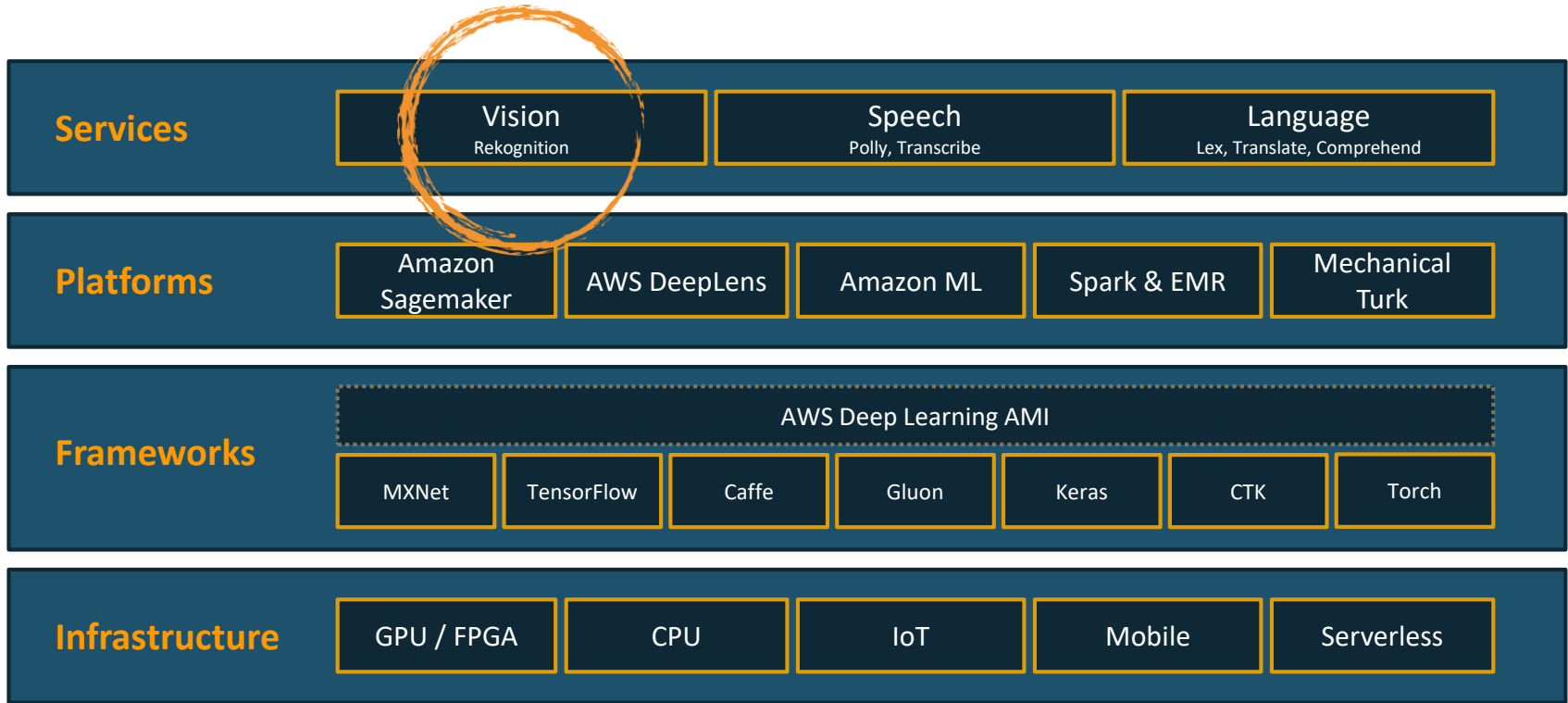




# Build or Buy for ML/DL Models?



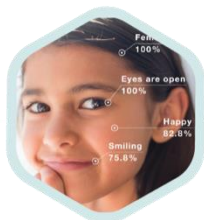
# The Amazon AI Stack



# Amazon Rekognition



Object & Scene  
Detection



Facial  
Analysis



Face  
Comparison



Facial  
Recognition



Celebrity  
Recognition



Image  
Moderation



Text  
Detection

**“Amazon Rekognition enables us to quickly and efficiently add value through various automated metadata tagging processes, and images and video segments are much easier to find for our enterprise and our customers.”**

*- Shane Murphy, Solutions Engineer, Scrippsnetworks*



**“Amazon Rekognition allows us to scalably identify and track actors across millions of frames of content with much higher reliability than any other solution we've used.”**

*- Jared Browarnik, Co-Founder & CTO, TheTake*



TheTake works with movie studios and TV networks to make their content shoppable - allowing viewers to identify and buy the products they see on screen.

# Real World Media Indexing

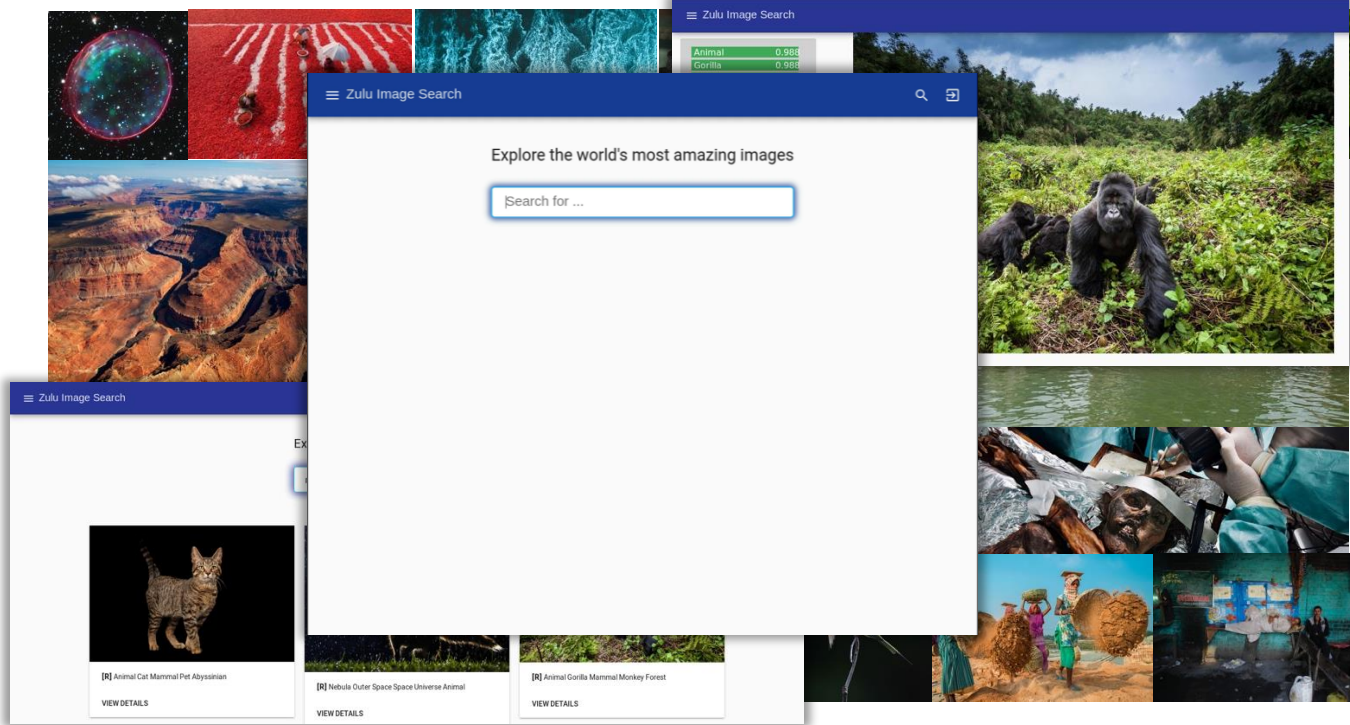
## Challenge

- Petabytes of images
- 100+ years of content
- Niche Image Categories
- Low & Ultra High Resolutions
- Artifacts & Noise
- Black and White Footage
- Historical Context
- High Accuracy Required



*How can we unleash the value of content in the cloud?*

# User Experience



[amzn.to/mesa-image-ai](https://amzn.to/mesa-image-ai)



# C-SPAN

## Automating Footage Tagging

- Built in 3 weeks
- Indexed against 99,000 people
- Index created in one day
- Saved ~9,000 hours a year in manual curation costs
- Live video with frame sampling



*Previously, only about half of all footage was indexed due to the immense time requirements required by manual processes*

## Current solution

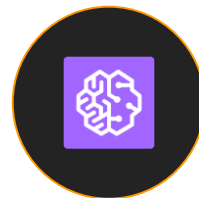
G-SPAN



Video



Frame selection



Amazon Rekognition Image

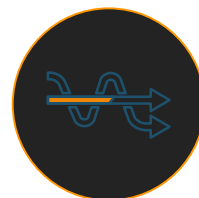
## Limitations



Image analysis



Temporal information lost



Motion context lost



# Introducing Amazon Rekognition Video



Object and activity  
Detection



Person tracking



Face recognition



Real-time  
live stream



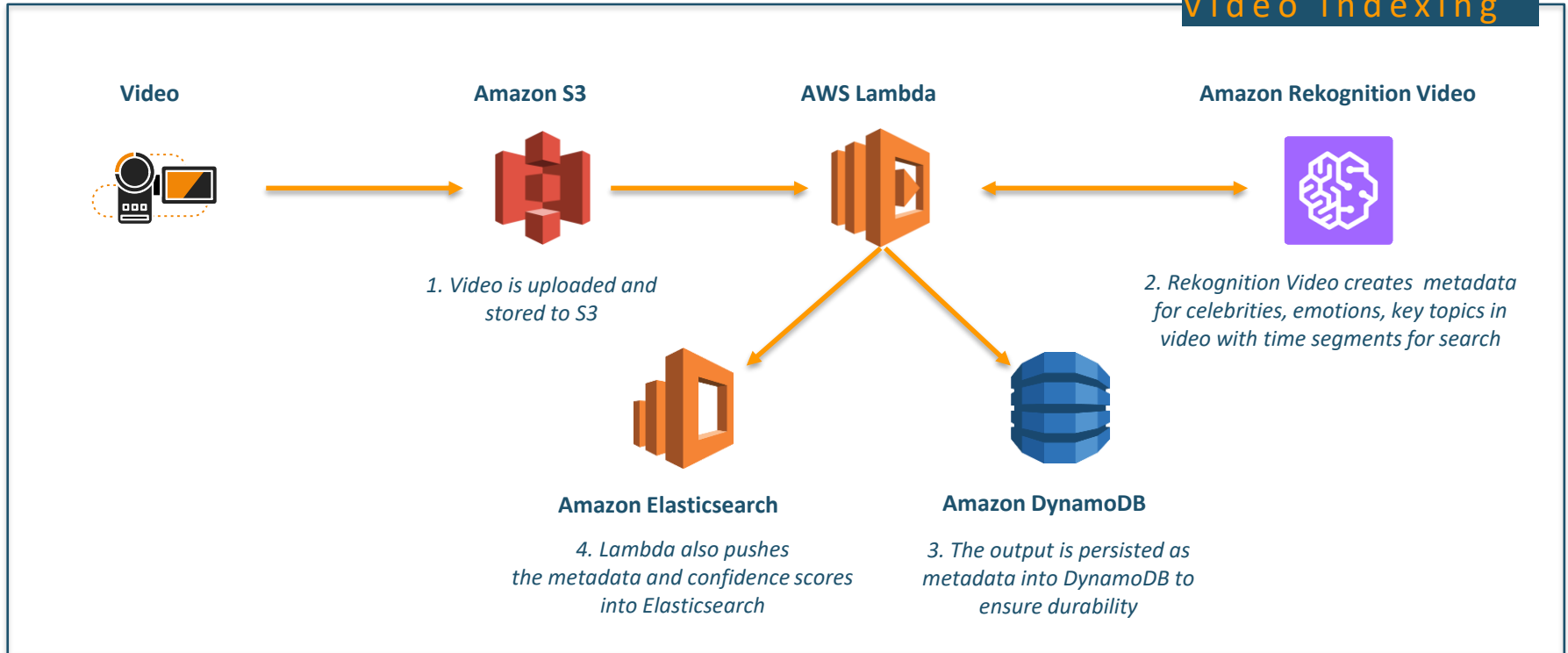
Unsafe video  
detection



Celebrity  
recognition

# Video Search with Deep Learning

## Video indexing



# Enriching Media Workflows

## Automated Media Metadata Extraction

Automate the creation of a rich metadata index, extracted from audio visual content.

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## Person in Scene Detection

Identify the precise timecodes when actors and other public figures enter and leave a scene, both visually and in spoken dialog.

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## Automated Compliance

Produce visual and audio information that can help reduce the manual time it takes to perform compliance workflows.

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## Brand Detection

Identify visual content that is associated with a specific brand, to provide a powerful content index.

# Enriching Media Workflows Continued

## Closed Captioning

Convert speech into local language text for real time broadcasts and stored video.

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## Language Translation

Convert transcripts and metadata to other languages. Improve localization workflows and search experience. Real-time captioning.

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## Content Recommendations

Centralization and analysis of massive amounts of disparate data formats make predictions and personalize services

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## Ad Personalization

Seamless integration of personalized ads into video streaming

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## Fraud Detection

Analyze and monitor systems for security compliance and intrusions

When can I add a value to my content and services?  
Can I add a value to my content and services?

[amzn.to/MESA-AWS](https://amzn.to/MESA-AWS)

***Thanks!***  
*@shawnprzybilla*