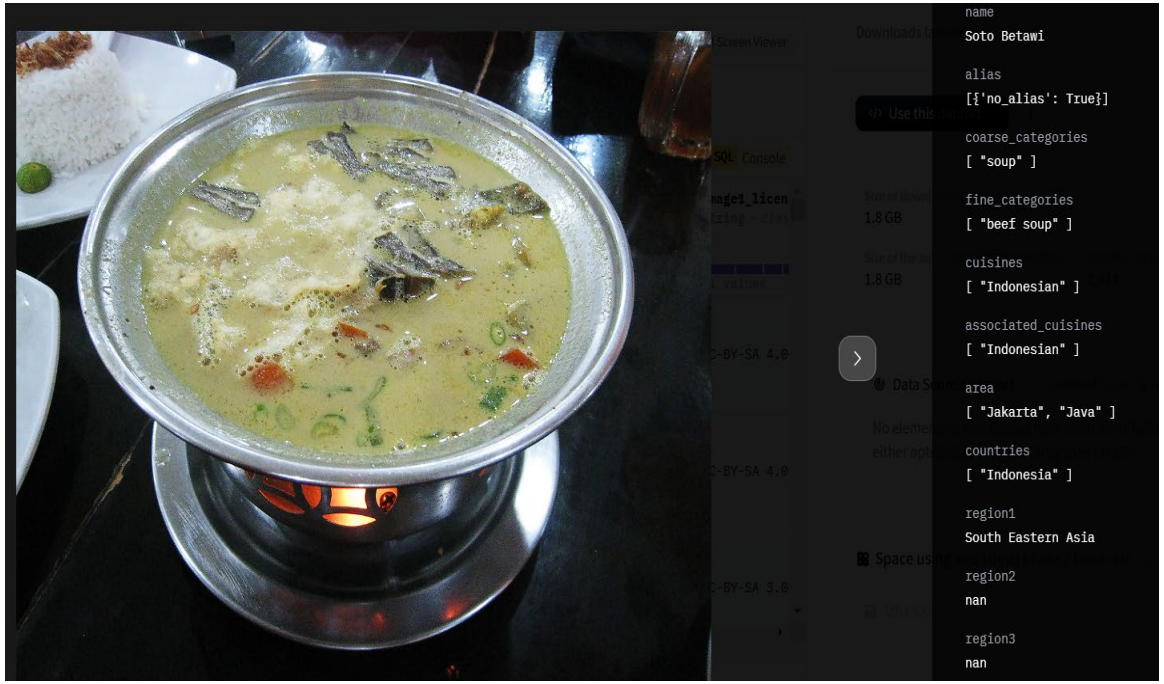
AI Technology Solutions *to* Identify and Grade Food-Images

End-to-End Solutions Built on AWS Platform

Business Problem

IATA estimates that passenger flights generate approximately six million tonnes of waste per year. Some 20% of this is untouched food and drink, which the association estimates to carry a value of $4 billion

Industry is exploring innovations for improving what's served up on the tray to reduce wastage and improve passenger experience



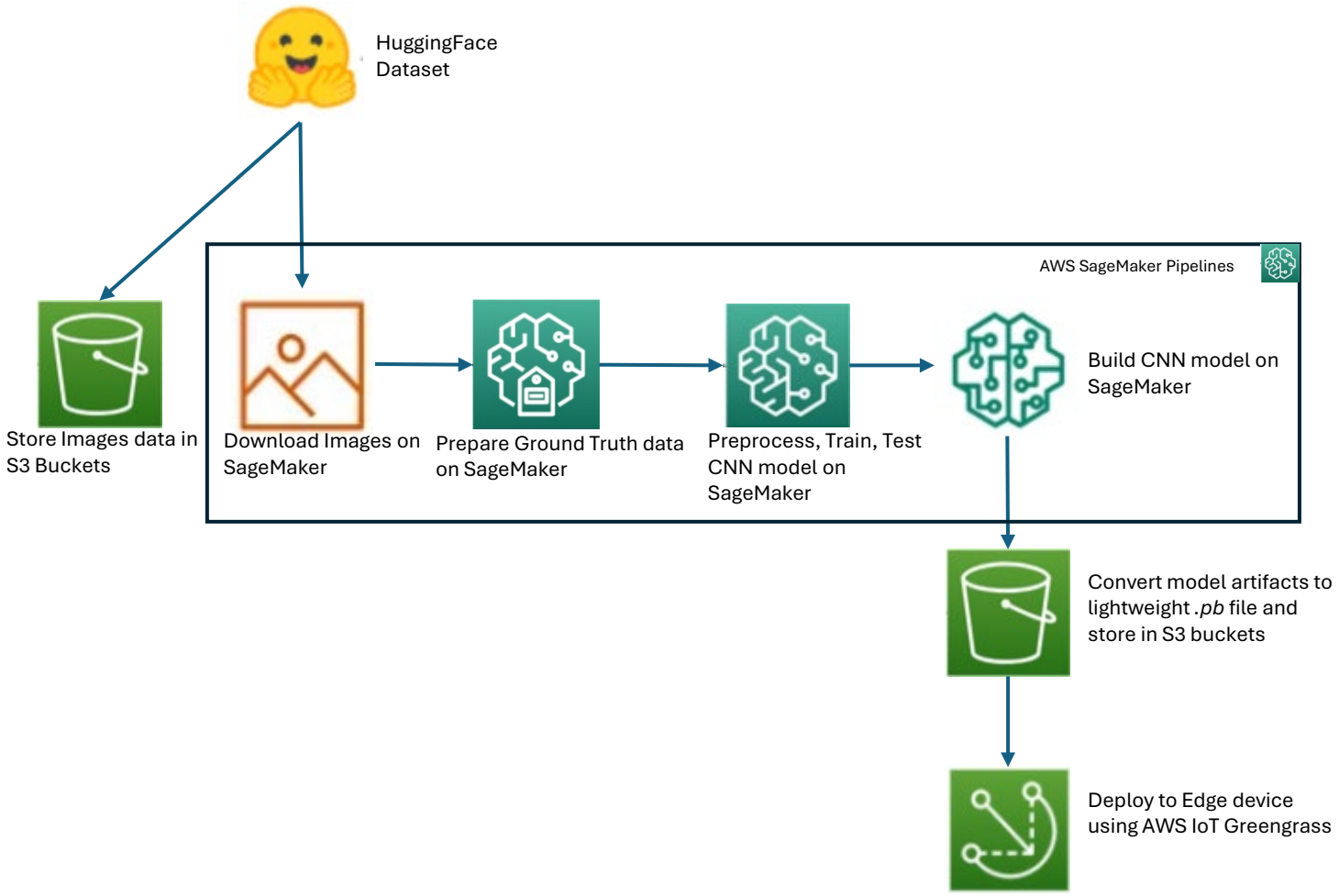
Hugging Face Dataset

- 2400 different dishes from different cuisines
- Images and different dishes are identified but images are not graded
- worldcuisines/food-kb

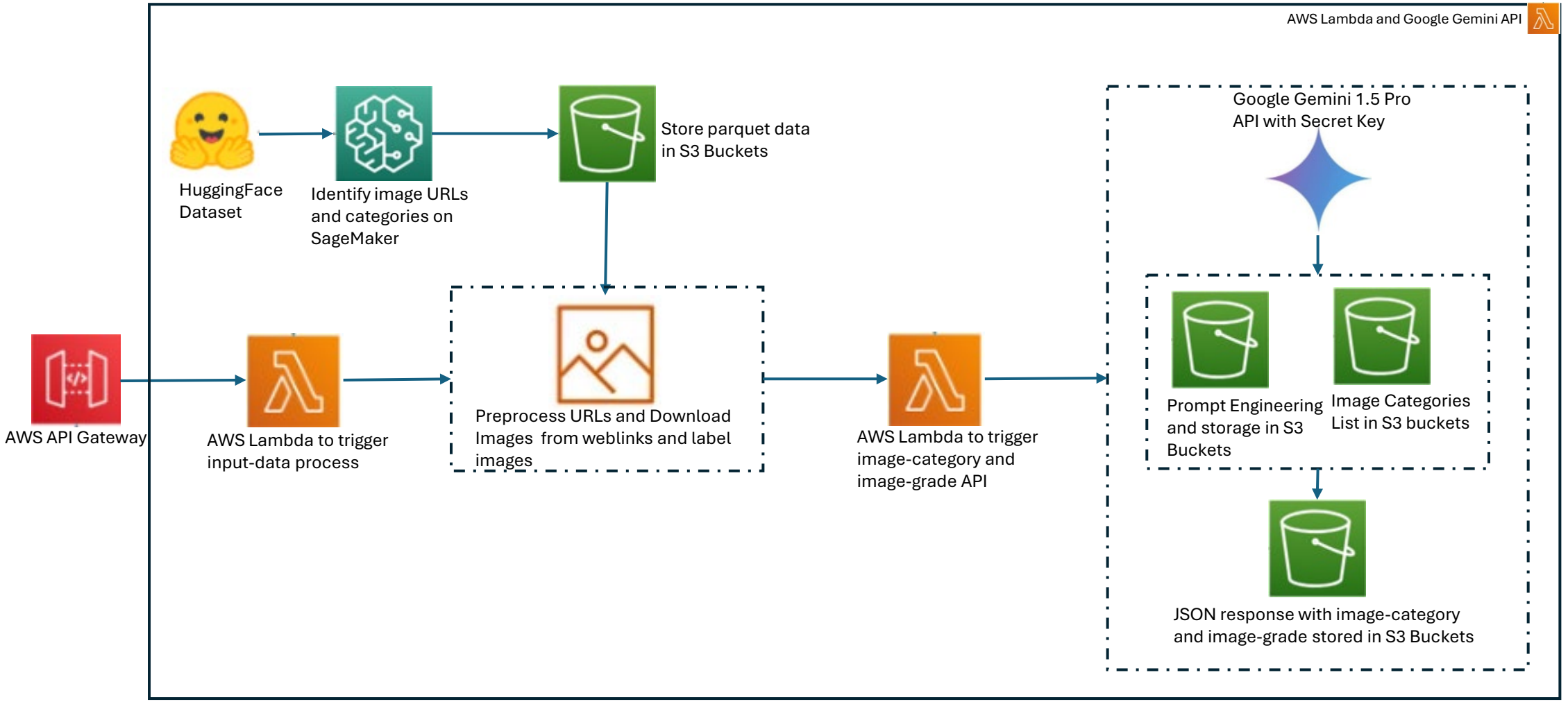
Two different AI solutions based on accuracy, latency and go-to-market speed

	Identify food in a dish	Grade food quantity
Approach-1	Train and validate Image-classification model -Convoluted Neural Networks -Ground Truth data for model training	Train and validate Image-grading model -Convoluted Neural Networks -Ground Truth data for model training
Approach-2	Inference Google Gemini Pro LLM -Prompt Engineering of Multi-modal Image-to-Text LLMs -API Wrapper	Inference Google Gemini Pro LLM -Prompt Engineering of Multi-modal Image-to-Text LLMs -API Wrapper

Convoluted Neural Network



End-to-End AI solution with Google Gemini LLM



Performance Metrics

Convoluted Neural Network Model:

- Classification Accuracy of CNN Model trained on 2000 images: 13.6%
- Limited image count within each category classification
- The performance is highly dependent on the Ground Truth data labeling and size

Google Gemini LLM API Wrapper:

- Classification Accuracy: 95%
- Grading Accuracy: 60%
- Significantly low OpEx
- The performance is highly dependent on the Prompt Engineering