



AWS Columbus Learning Days

**Unleash the power of AI/ML by
carefully selecting your use case**

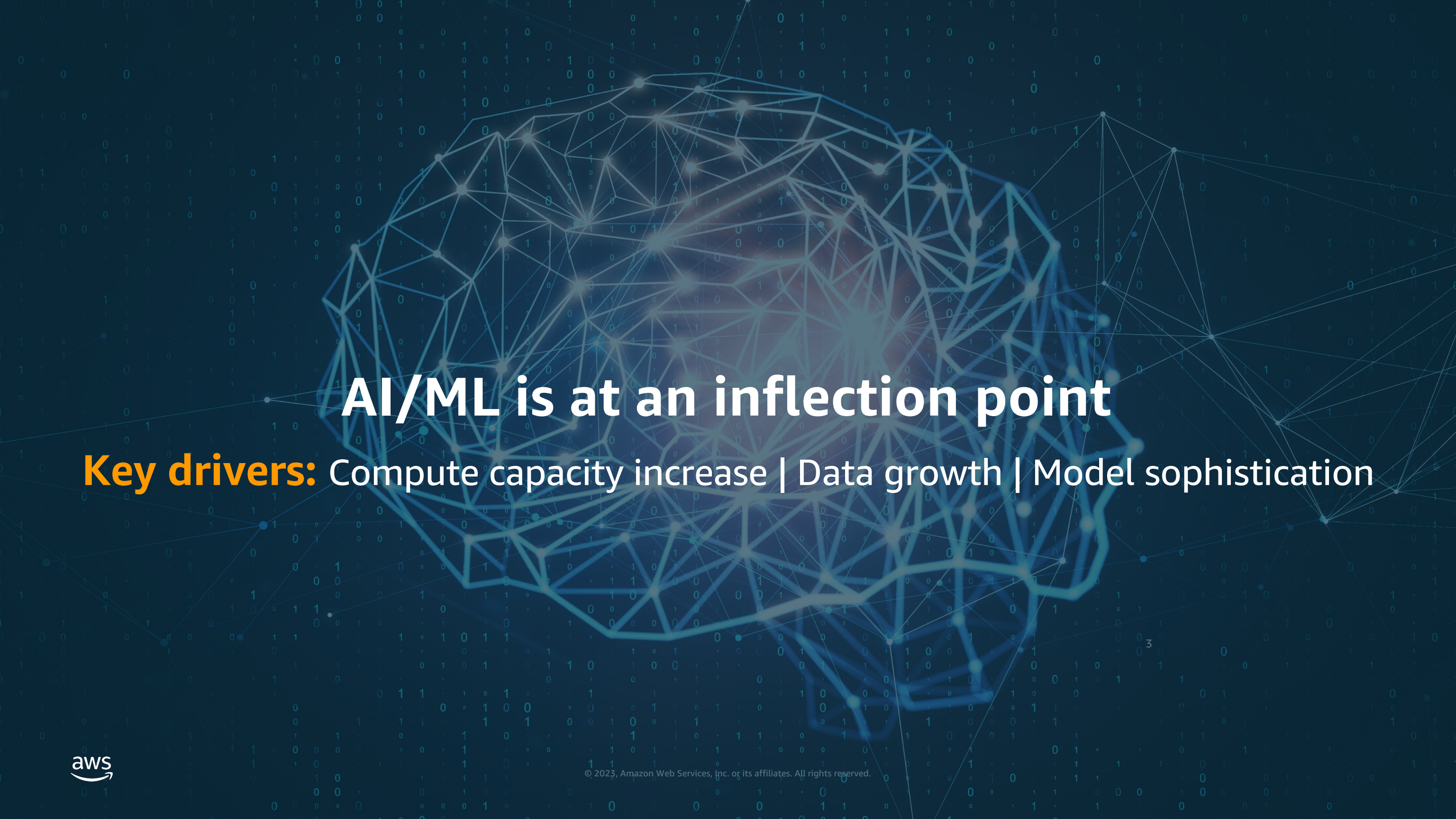
Abhilash Thallapally

Solutions Architect, State and Local Government & Education

Amazon Web Services

Agenda

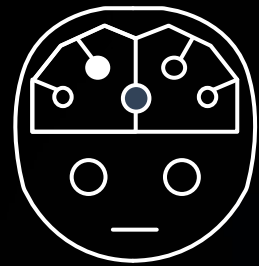
- Artificial intelligence (AI) and machine learning (ML) definitions
- AI/ML use cases in public sector
 - Speech and language
 - Intelligent document processing (IDP)
 - Computer vision
 - Predictive analysis
- Generative AI
- Addressing generative AI in the public sector



AI/ML is at an inflection point

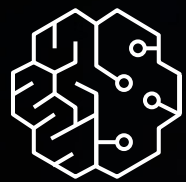
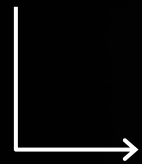
Key drivers: Compute capacity increase | Data growth | Model sophistication

AI, ML, deep learning?



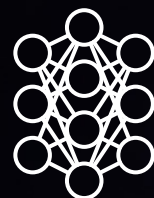
Artificial Intelligence (AI)

Any technique that allows computers to mimic human intelligence using logic, if-then statements, and machine learning



Machine learning (ML)

A subset of AI that uses machines to search for patterns in data to build logic models automatically



Deep learning (DL)

A subset of ML composed of deeply multi-layered neural networks that perform tasks like speech and image recognition

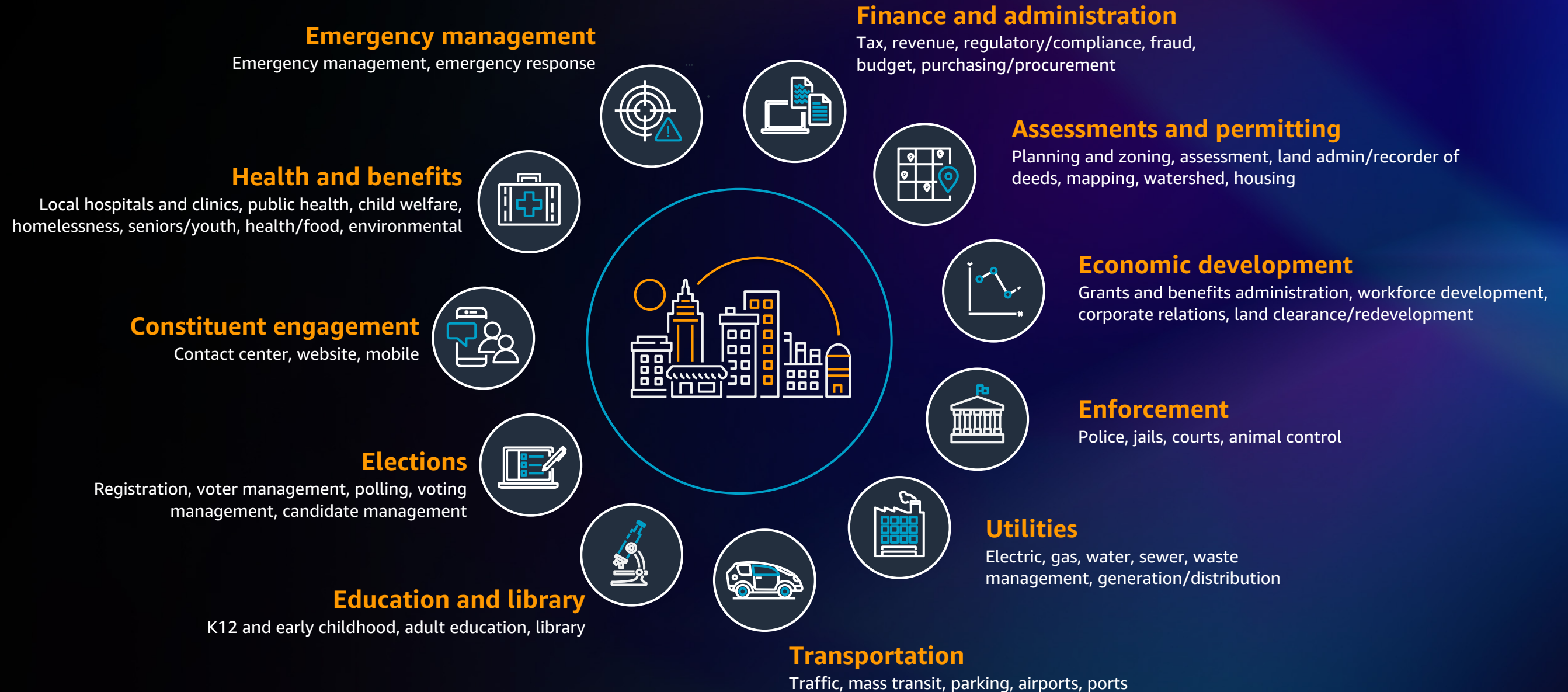


Generative AI

Powered by large models that are pretrained on vast corpuses of data and commonly referred to as foundation models (FMs)

4

Machine learning is going mainstream in public sector



Top AI/ML use cases for state and local government



**Speech
and language**

SampleOutput.pdf (1 page)

Employment Application

This is a sample employment application form. and answer all questions.

Personal Information	
Full Name:	Jane Doe
Phone Number:	555-0100
Home Address:	123 Any Street, Any Town, USA
Mailing Address:	Same as home address

Work History	
Current Company:	Any Company (2018-Current)
	Any Role
Company#1:	Previous Company # 1 (2014-2017)
	Previous Role # 1
Company#2:	Previous Company #2 (2010-2014)
	Previous Role # 2

**Intelligent document
processing**



**Computer
vision**



**Predictions
and insights**

The Amazon Web Services (AWS) AI/ML stack

BROADEST AND MOST COMPLETE SET OF MACHINE LEARNING CAPABILITIES

AI SERVICES

SPECIALIZED

BUSINESS PROCESSES

Amazon Personalize
Amazon Forecast
Amazon Fraud Detector
Amazon Lookout for Metrics

SEARCH

Amazon Kendra

CONVERSATION

Amazon Lex
Amazon Transcribe Call Analytics
Contact Lens
Voice ID

CODE + DEVOPS

Amazon CodeGuru
Amazon CodeWhisperer
Amazon DevOps Guru

INDUSTRIAL

Amazon Monitron
Amazon Lookout for Equipment
Amazon Lookout for Vision

HEALTH

Amazon HealthLake
Amazon Comprehend Medical
Amazon Transcribe Medical
Amazon Omics

CORE

TEXT

Amazon Translate Amazon Comprehend

SPEECH

Amazon Polly Amazon Transcribe

VISION

Amazon Textract Amazon Rekognition AWS Panorama

ML SERVICES

Amazon Bedrock

Amazon SageMaker

STUDIO IDE

Prepare data

Build with notebooks

Train models

Deploy in production

Store features

Geospatial ML

Tune parameters

Manage and monitor

----- CI/CD | GOVERNANCE | RESPONSIBLE ML -----

CANVAS

No-code ML for business analysts

GROUND TRUTH

Label data

STUDIO LAB

Learn ML

EDGE MANAGER

Manage edge devices

ML FRAMEWORKS and INFRASTRUCTURE

PyTorch, Apache MXNet, TensorFlow

Amazon EC2

CPUs

GPUs

AWS
Inferentia

AWS
Trainium

Habana
Gaudi

FPGA

Top AI/ML use cases for state and local government



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**Computer
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**Predictions
and insights**

AI/ML-enabled citizen engagement

Engage citizens and drive improvements in customer satisfaction

- Improve contact center agent effectiveness with real-time translation and decision support using Amazon Connect and Contact Center Intelligence
- Analyze call and text interactions with citizens to spot issues and trends and drive improvement
- Improve self service



Using AI to improve agent efficiency

“During peak hours, previously you’re 45-50 minutes on hold, and now that’s has been reduced to about three and a half minutes. One of the other benefits we’ve gotten from Amazon Connect is sentiment analysis. On a call, we get real-time feedback on whether or not the customer was happy, frustrated, or angry...”

—Benny Chacko, Deputy General – LA County Internal Services Department



Top AI/ML use cases for state and local government



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Intelligent document
processing



Computer
vision



Predictions
and insights

Extract insights from unstructured content

Extract insights from unstructured documents and forms, like images, PDFs, and audio

- Analyze text with natural language processing (NLP) to identify topics, extract entities, understand sentiment, and classify documents with Amazon Textract, Amazon Rekognition, and Amazon Comprehend
- Translate content at scale with Amazon Translate

[illegible] Demographics

- Geography
- Gender
- Age
- Health history

 Disease indicators

- Anatomy
- Symptoms
- Diagnosis
- Treatment
- Test Name
- Test Result

 Rx

- Medication Name
- Strength
- Route

King County Assessor's Office

CHALLENGE

Reduce data entry, eliminate data errors, and improve data time lines.

SOLUTION

Intelligent documents processing for documents and electronic files, streamlining and unlock data and information from paper documents and electronic files

RESULT

King County employees will focus on higher value, more satisfying work, and ultimately help the county realize its vision for connected communities, connected data, and connected government."



Top AI/ML use cases for state and local government



Speech
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Intelligent document
processing



Computer
vision

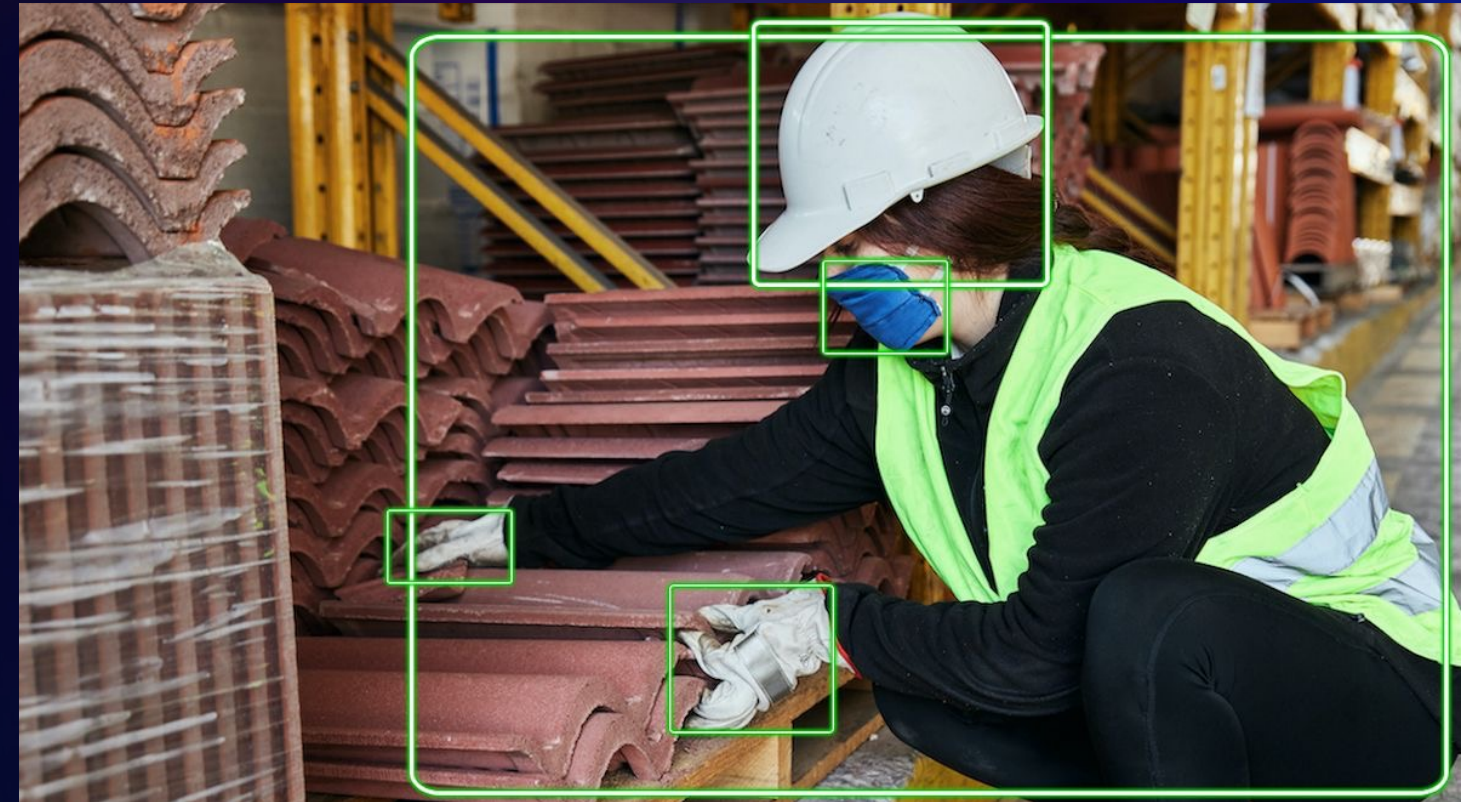


Predictions
and insights

Content analysis and object detection

Extract insights and identify objects of interest from large volumes of images and videos with Amazon Rekognition

- Detect personal protective equipment (PPE) to improve worker safety
- Analyze vehicle traffic and pedestrian and bicycle safety
- Detect objects of interest in video and reduce human effort required to review footage



Assessing damage from natural disasters

EagleView runs deep learning models on AWS to make quicker, more accurate assessments of property damage within 24 hours of a natural disaster. Amazon Elastic Inference makes those workflows more cost effective at scale.



Top AI/ML use cases for state and local government



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processing



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vision

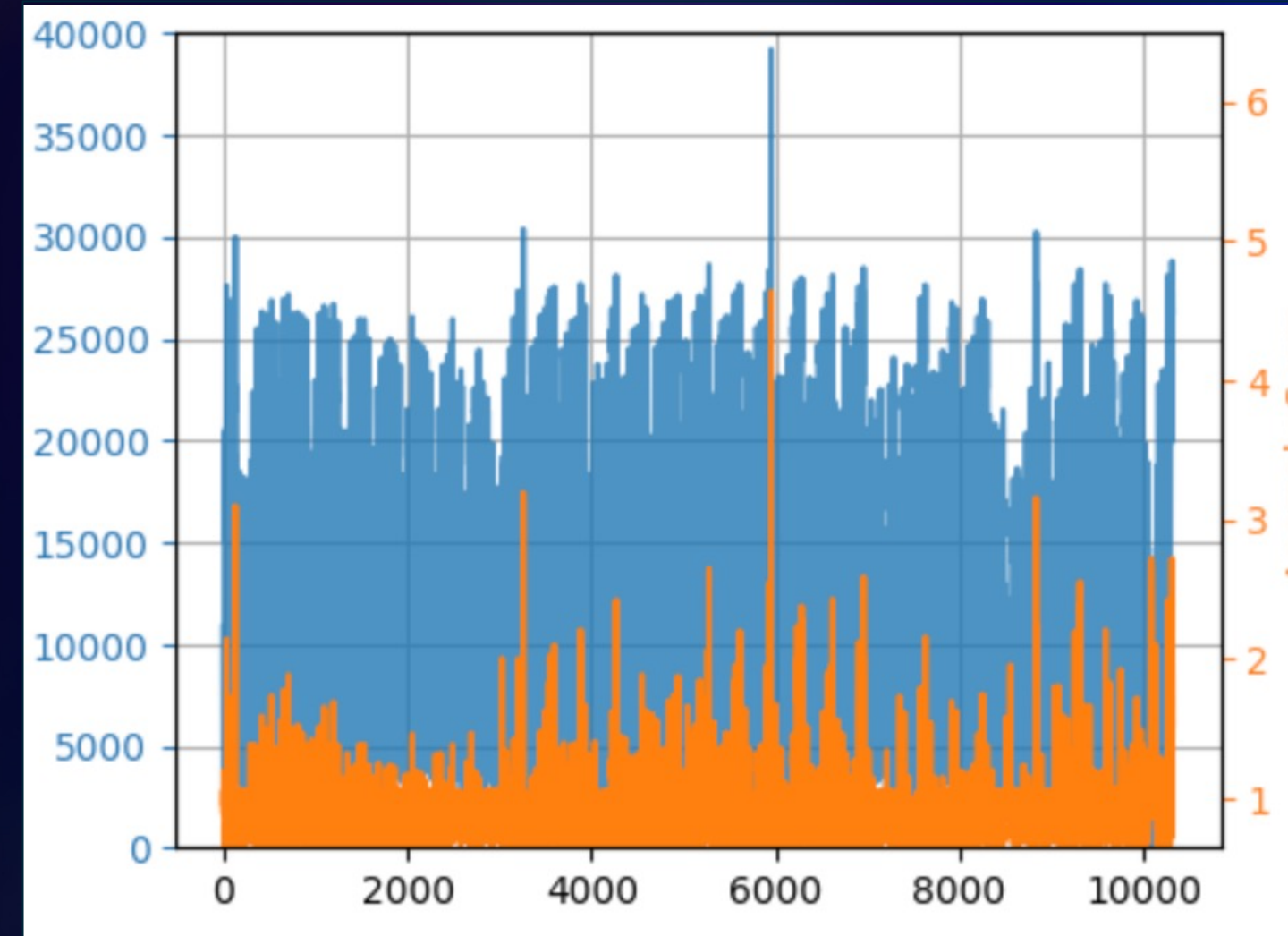


Predictions
and insights

Fraud detection and prevention

Detect and prevent fraud, waste, and abuse

- Enhance accuracy and speed to help detect and prevent waste fraud and abuse
- Managed service approach with prebuilt ML models for fraud detection
- Supervised and unsupervised models for developing highly targeted models to utilize customer data as part of fraud prevention efforts



Identify fraud and other anonymous activities

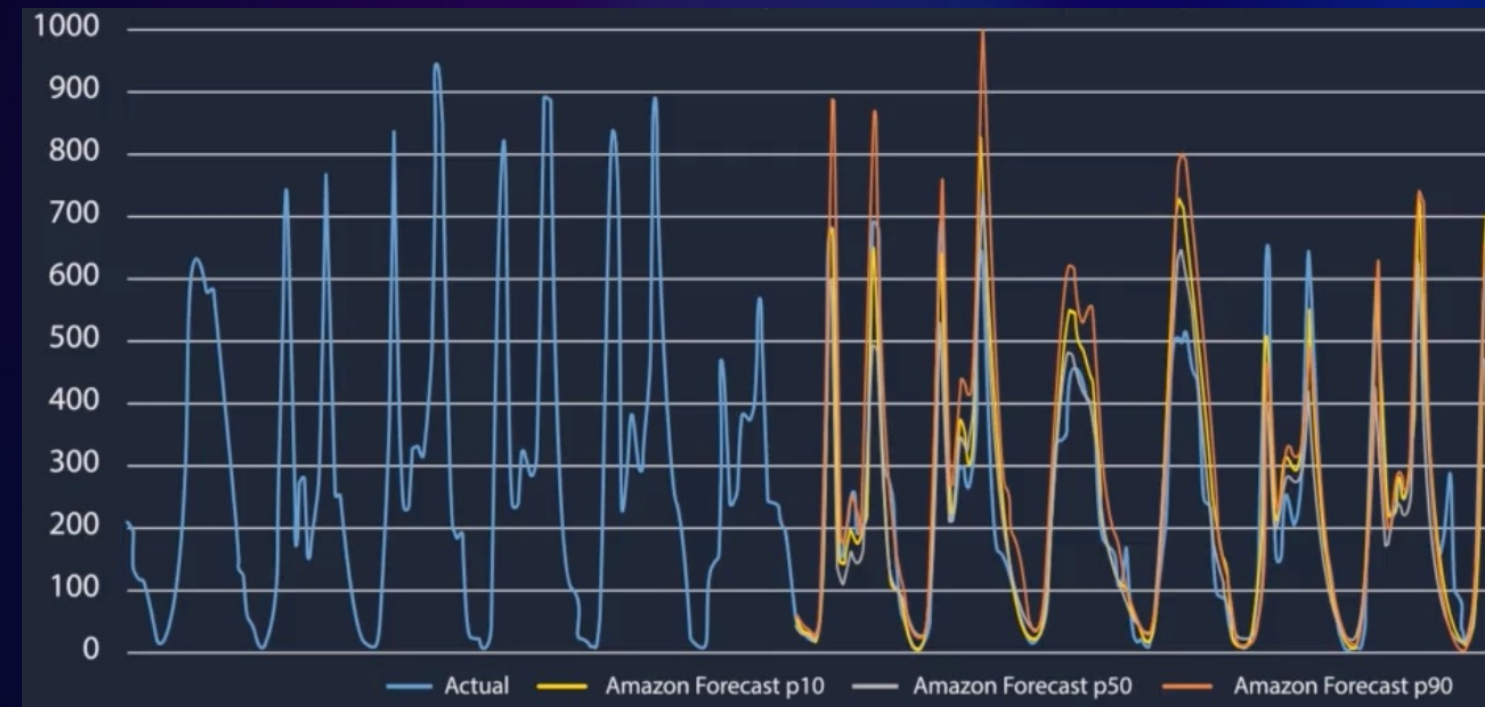
FINRA, one of the largest security regulators in the United States, was established to monitor and regulate financial trading practices; using Amazon EMR, FINRA can capture, analyze, and store a daily influx of 135 billion records in order to identify fraud and other anonymous activities



Machine learning to forecast trends and support decisions

Accurate, time series forecast with machine learning

- Predicting service demand or program activities
- Allocating resources to optimize impact and outcomes for citizens
- Financial planning and revenue / cost forecasts



Predictions and forecasts from internet of things (IoT) and sensor data

Leverage data from smart cities and facilities

- Smart cities
- Predictive maintenance
- Facility management

Learn more about
Amazon Monitron

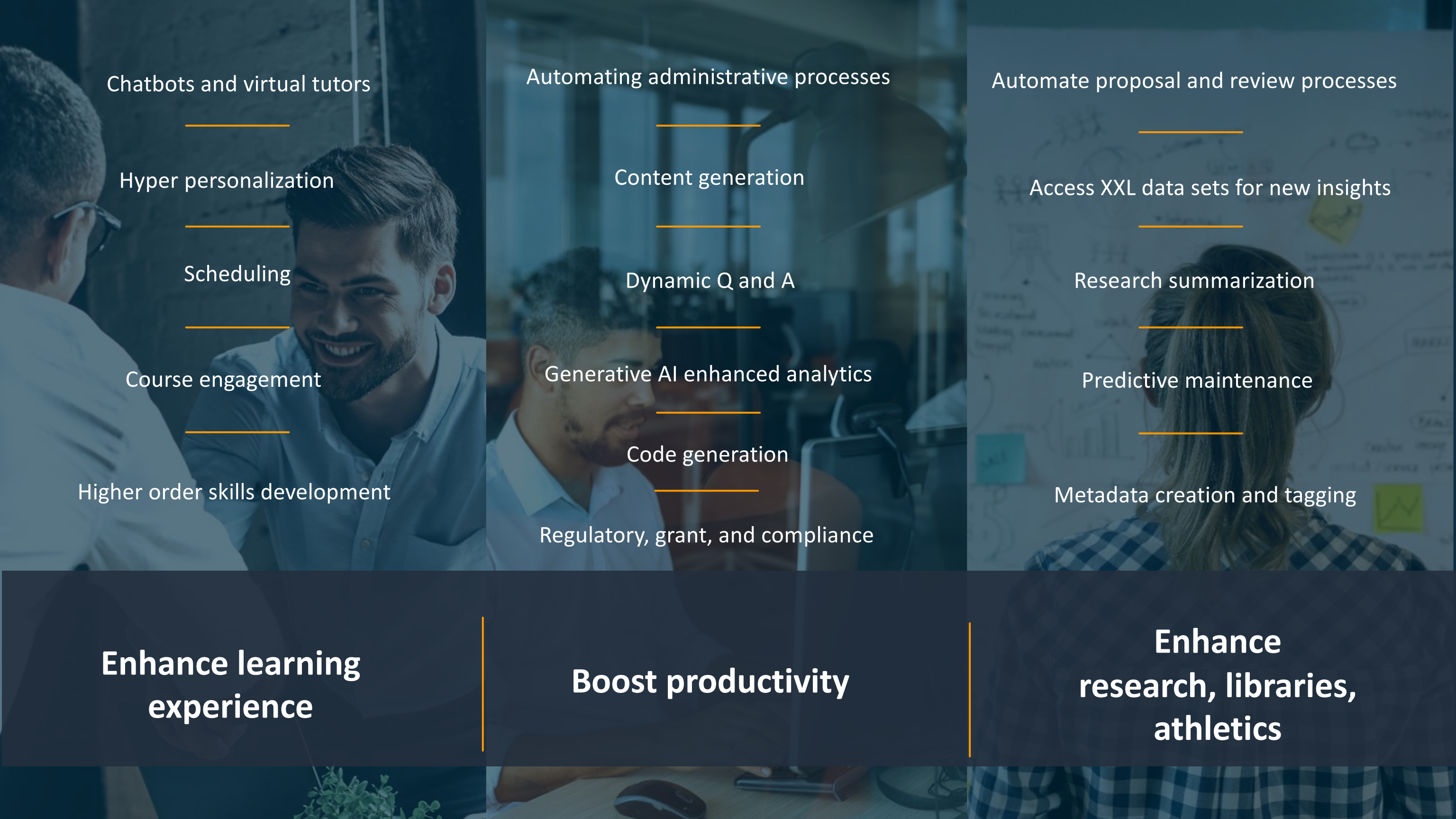


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AI/ML use cases in education





Chatbots and virtual tutors

Hyper personalization

Scheduling

Course engagement

Higher order skills development

**Enhance learning
experience**

Automating administrative processes

Content generation

Dynamic Q and A

Generative AI enhanced analytics

Code generation

Regulatory, grant, and compliance

Boost productivity

Automate proposal and review processes

Access XXL data sets for new insights

Research summarization

Predictive maintenance

Metadata creation and tagging

**Enhance
research, libraries,
athletics**

AI/ML use cases in healthcare





Medical research

Patient to trial matching

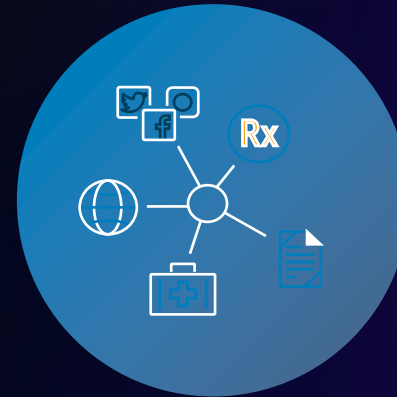
Multi-modal data analysis



Clinical efficiency

Longitudinal patient records for full patient picture

Automate medical image interpretation



Operational efficiency

Auto-generate referral letters, clinical coding, and prior authorization

Intelligent document processing



Patient experience

Patient outcome prediction

Personalize patient discharge instructions and treatment plans



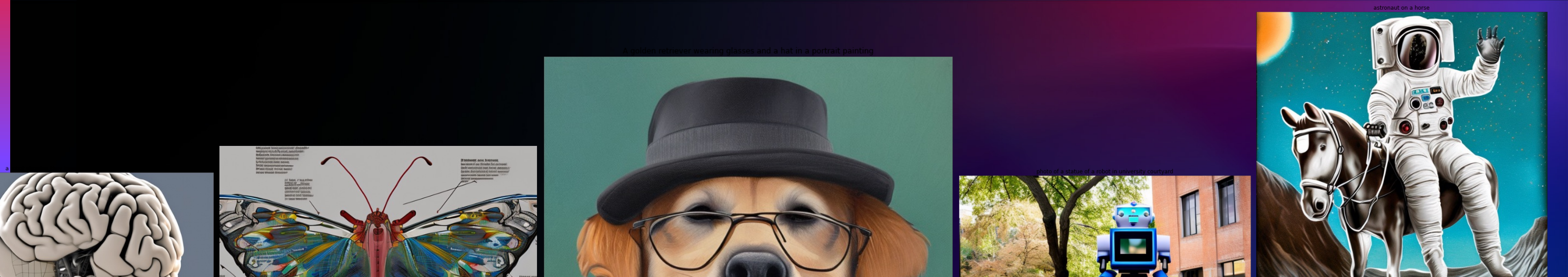
Digital health

Patient care concierge

Remote care management

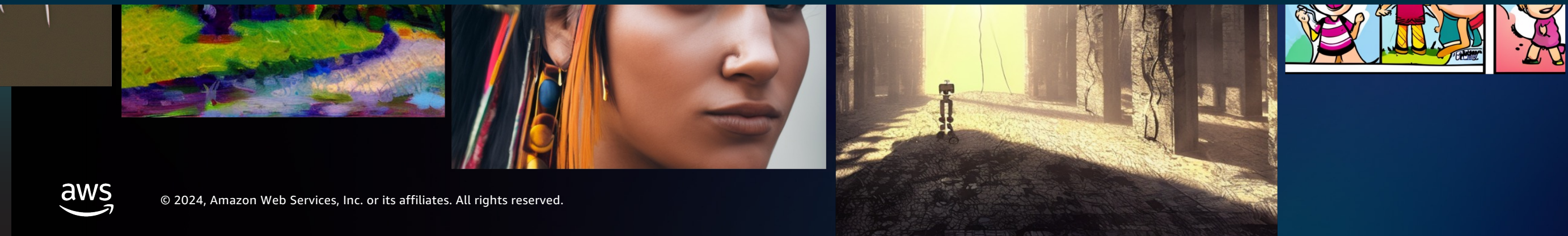
Generative AI on AWS





Question: What is generative artificial intelligence?

- Creates new content and ideas, including conversations, stories, images, videos, and music
- Powered by large models that are pretrained on vast corpuses of data and commonly referred to as foundation models (FMs)



Common use cases



Text
generation



Q&A



Text
summarization



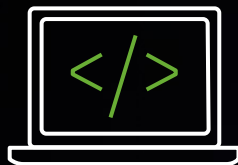
Text
extraction



Paraphrase
rephrase



Search



Code
generation



Image
generation



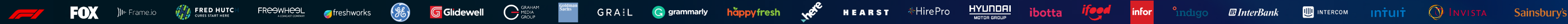
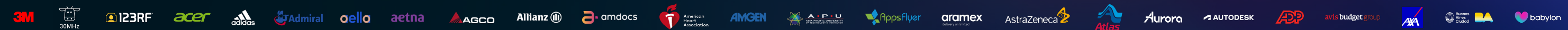
Image
classification



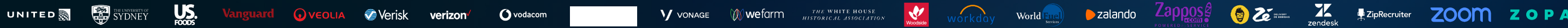
Audio
generation



Video
generation



More than 100,000 customers use AWS for ML



Start your AI journey today



Select the right use case

Start your AI journey today



Select the right use case



Empower your teams
through a variety of training
opportunities

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Digital training

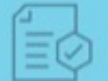


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Learning Plan



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FREE

EN | 45m 00s

★ 5.0

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Migrate a monolith web application to AWS using Application Migration...

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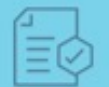
Challenge AWS Game Skills: Basic

PREMIUM SUBSCRIPTION



Exam Prep: AWS Certified Solutions Architect - Professional (SAP-C02) (wit...

PREMIUM SUBSCRIPTION



Exam Prep: AWS Certified Advanced Networking - Specialty (ANS-C01) (with...

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Industry Quest: Financial Services

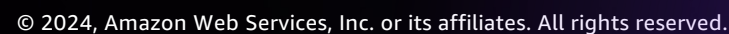
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Learn the fundamentals
of generative AI for
real-world applications

Learn the fundamentals of generative AI for real-world applications

 Migrate a monolith web application to AWS using Application Migration... REQUIRES SUBSCRIPTION	 Challenge AWS Game Skills: Basic REQUIRES SUBSCRIPTION	 Exam Prep: AWS Certified Solutions Architect - Professional (SAP-C02) (wit... REQUIRES SUBSCRIPTION	 Exam Prep: AWS Certified Advanced Networking - Specialty (ANS-C01) (with... REQUIRES SUBSCRIPTION	 Industry Quest: Financial Services REQUIRES SUBSCRIPTION
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Start your generative AI journey today

1

Select the right use case

2

Empower your teams
through a variety of training
opportunities

3

Get started on a PoC for
your top use cases

Thank you!

Abhilash Thallapally
thallaab@amazon.com

Please fill out the session survey

