

# Generative AI/ML and AI governance for the public sector

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# AI/Machine learning (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 Al**

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

# Challenges we are hearing from public sector customers



Demand for government services is rising while resources and capacity to deliver them aren't keeping pace



Citizens increasingly expect the government to **provide modern digital experiences** for conducting online transactions



**Aging infrastructure** for data capture, storage, and management **creates friction** for leveraging data for analytics and machine learning



Complex security, privacy, and compliance requirements create barriers to change and block adoption of many SaaS solutions



Risk averse culture and institutional inertia slow innovation



# Machine learning is going mainstream in public sector

#### **Emergency management**

Emergency management, emergency response



#### Finance and administration

Tax, revenue, regulatory/compliance, fraud, budget, purchasing/procurement



#### Assessments and permitting

Planning and zoning, assessment, land admin/recorder of deeds, mapping, watershed, housing



#### **Health and benefits**

Local hospitals and clinics, public health, child welfare, homelessness, seniors/youth, health/food, environmental



#### Economic development

Grants and benefits administration, workforce development, corporate relations, land clearance/redevelopment



#### **Enforcement**

Police, jails, courts, animal control



Registration, voter management, polling, voting management, candidate management

**Constituent engagement** 

Contact center, website, mobile



#### **Education and library**

K12 and early childhood, adult education, library



#### **Utilities**

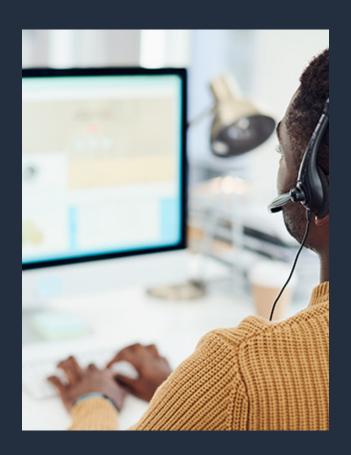
Electric, gas, water, sewer, waste management, generation/distribution

#### **Transportation**

Traffic, mass transit, parking, airports, ports



# Top AI/ML use cases for state and local government



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 Any Company (2018-Current) Current Company: Previous Company # 1 (2014-20) Company#1: Previous Role # 1 Previous Company #2 (2010-2014 Company#2: Previous Role # 2





Speech and language

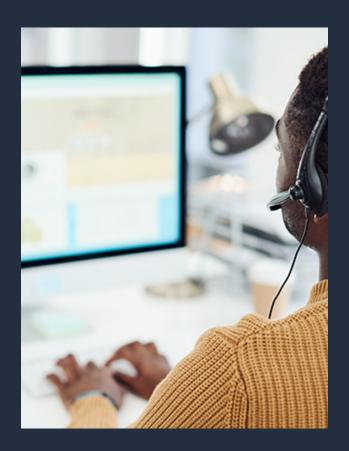
Intelligent document processing

**Computer** vision

Predictions and insights



# Top AI/ML use cases for state and local government



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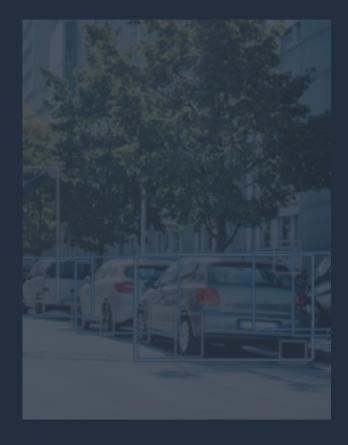
Any Role

Company#1:

Previous Company # 1 (2014-20)

Previous Role # 1

Previous Role # 2





Speech and language

Intelligent document processing

Computer vision

Predictions and insights



## Generative AI-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



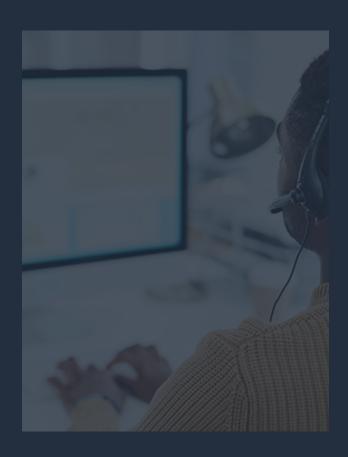
# Using Al to improve agent efficiency

"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..."

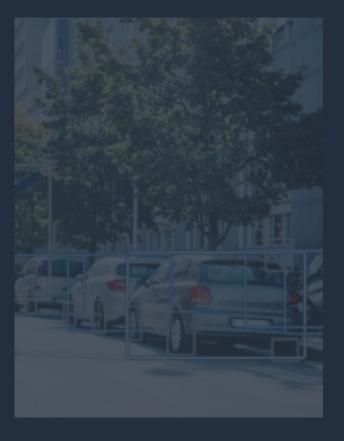
—Benny Chacko, Deputy General – LA County Internal Services Department



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Speech and language

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



# 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."



## THE ALW SYMLE FOST BUBLIC SECTOR

#### Broadest and most complete set of machine learning capabilities

	Vision	Chatbots	Business tools	Search	Healthcare
AI SERVICES	Rekognition	Lex	Personalize	Kendra	HealthLake
	J		Forecast		Comprehend Medical
			Fraud Detector		Transcribe Medical
			Lookout for Metrics		
	Speech	Text		Code + DevOps	Industrial
	Polly	Comprehend	Contact centers	CodeGuru	Panorama Appliance and SD
	Transcribe	Translate	Contact Lens	DevOps Guru	Monitron, Lookout for
		Textract	Connect Voice ID		Equipment, Lookout for Vision



ML FRAMEWORKS & INFRASTRUCTURE

TensorFlow, PyTorch, Apache MXNet Deep learning AMIs & containers

GPUs

Inferentia

Elastic inference

FPGA

# Amazon Generative Al











# Question: What is generative artificial intelligence (AI)?

- 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



## Generative AI public sector application examples



#### **Constituent Communications**

Citizen engagement and feedback, transparency



#### **Finance**

Budget Optimization, fraud detection, risk assessment and mitigation



#### **Public Health**

Personalized care, population health assessments



#### **Constituent Services**

Urban planning, Personalized urban services



#### **Public Safety**

Public safety and crime prevention, Emergency response and disaster management



#### **Energy and utilities**

Energy management, Waste management, Smart grid optimization



#### **Transportation**

Trafic optimization, autonomous vehicle control, personalized transportation experiences



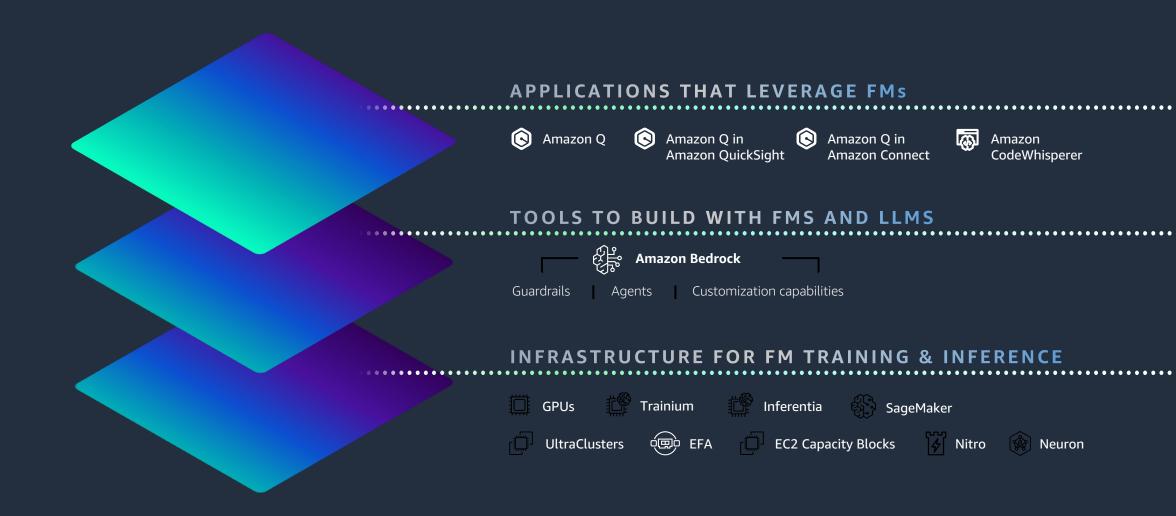
#### Research and Engagement

Environmental monitoring

Instead of sending your data to the model, bring the model to your data.

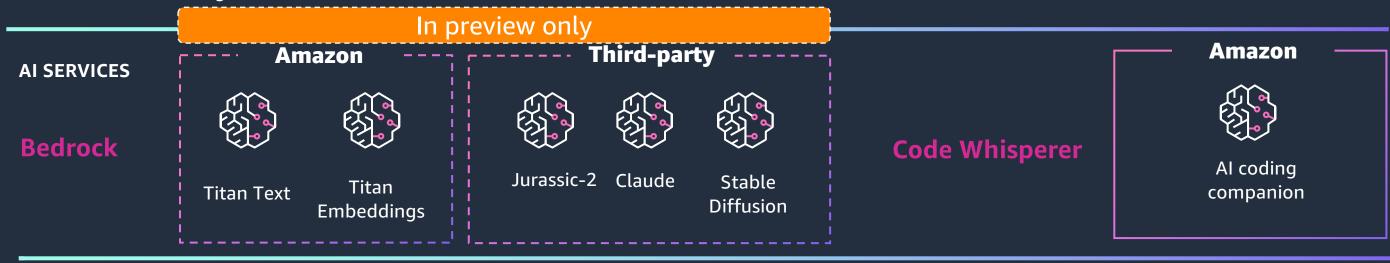


# Generative Al stack



# Amazon generative AI portfolio – Your choice

**Choice of many foundation models** 



**ML SERVICES** 

Sagemaker Jumpstart

#### Publicly available

stability.ai

Text2Image Upscaling



AlexaTM 20B



Flan T-5 models
DistilGPT2, GPT2
Bloom models

#### **Proprietary models**

co:here

generate-med

Cohere

Light₩n

Al21 labs

Lyra-Fr10B

Jurassic-1 Grande 17B

In preview only

ML FRAMEWORKS AND INFRASTRUCTURE

Self managed ML



three-way collaboration to move models to production on EC2 and Sagemaker



Hugging face

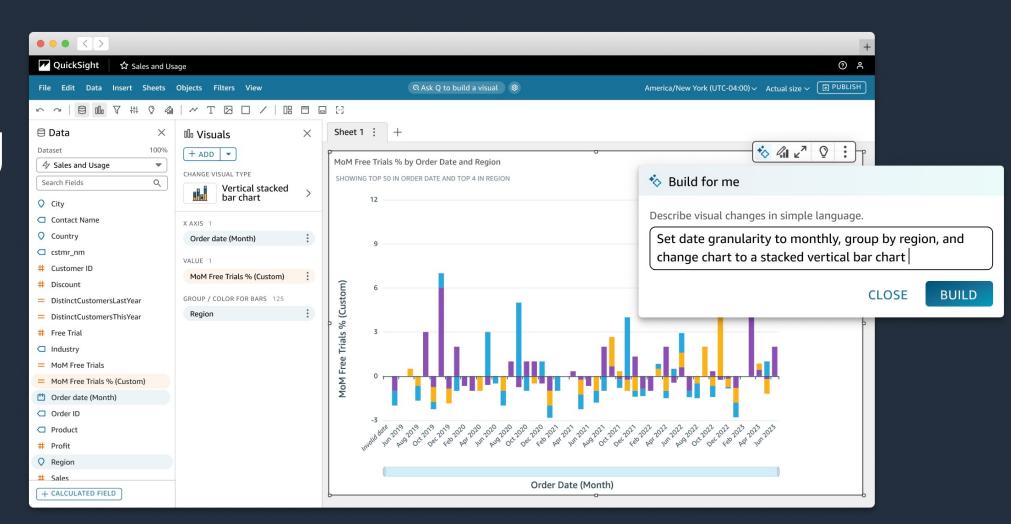


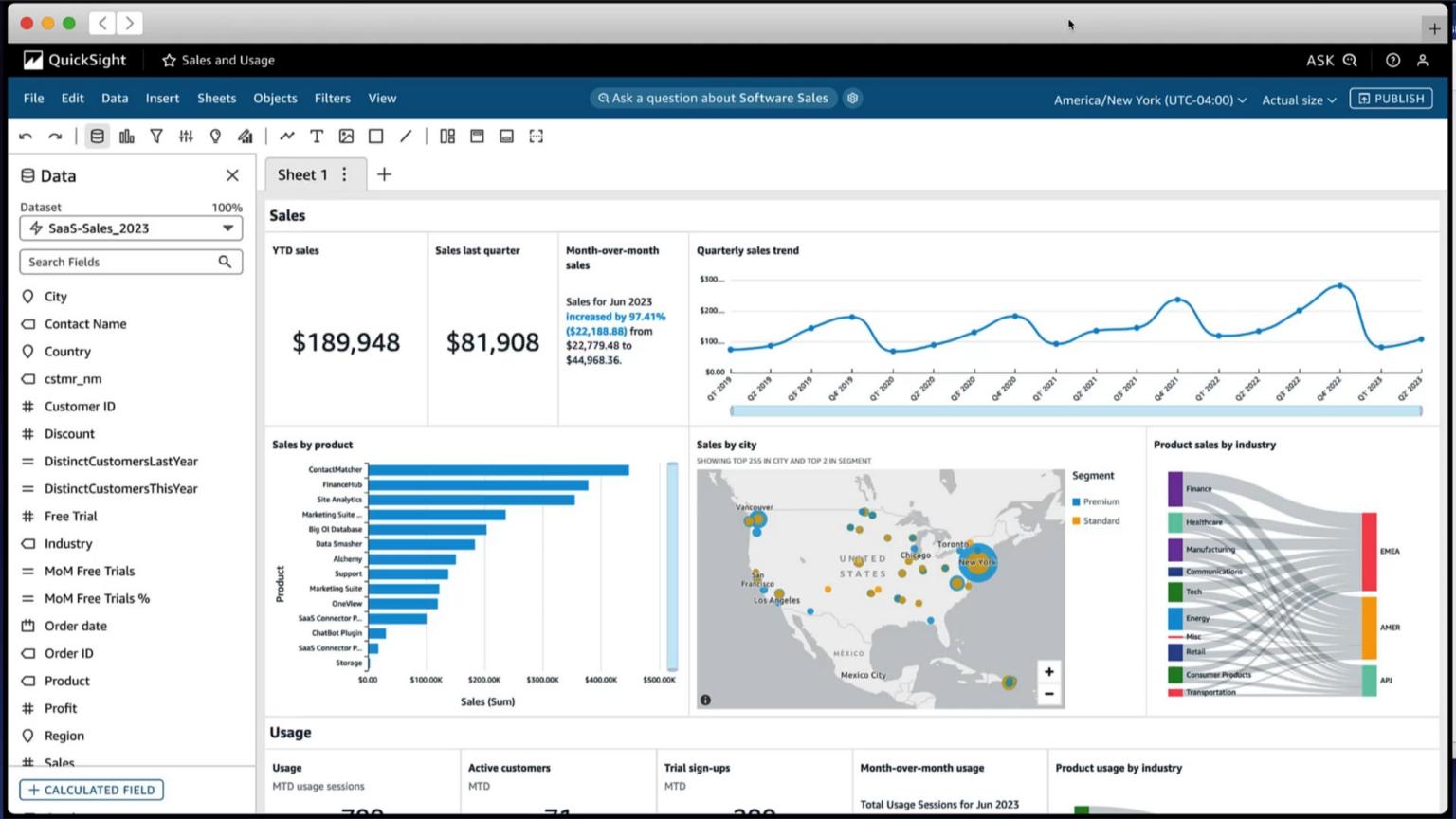
# Demos



# Visual authoring in QuickSight

Use everyday language to generate and fine-tune visuals in seconds





Amazon Bedrock keeps data secure and private



None of the customer's data is used to train the underlying model

All data is encrypted in transit and at rest

Data used to customize models remains within your VPC

Support for standards, including GDPR and HIPAA



# Guardrails for Amazon Bedrock

Safeguard your generative AI applications with your responsible AI policies

AVAILABLE IN PREVIEW

Easily configure harmful content filtering based on your responsible AI policies

Apply Guardrails to any FM or agent

Redact PII information in FM responses (coming soon)



# Pillars of responsible AI

#### Value alignment

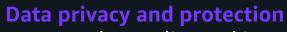
Systems should be designed and used in ways that align with the organization mission, social norms, and legal regulations





#### Inclusion

Inclusion of diverse and unique skills, experiences, perspectives, and cultural backgrounds



Protects the quality and integrity of data used as well as its relevance, access, and processing





#### **Training and education**

Appropriate knowledge sharing and education to understand purpose, use, and impact



Systems must be designed to minimize bias and promote inclusive representation





#### **Accountability**

Structured, maintaining human involvement and responsibility for design, development, decision processes, and outcomes

#### Transparency and explainability

Understanding how data is used and how decisions and outcomes are made understandable to a human





## How to address GenAI in public sector

- How can we support you in ensuring accuracy and authority of model outputs?
- How can we use "guardrails" to minimize inappropriate content?
- How can we maximize the public investment and minimize cost?
- What are your latency requirements for specific use cases?
- What are the potential regulatory, data privacy, and security considerations that may dictate model architecture.
- How can we ensure proprietary, copyrighted, and IP concerns are addressed?





# Thank you!

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