

# AWS State, Local, and Education Learning Days

Chicago



BREAKOUT

# Generative AI for Public Sector

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Local Governments US

AWS

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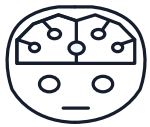




# AI/Machine learning (ML) is at an inflection point

**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 AI

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

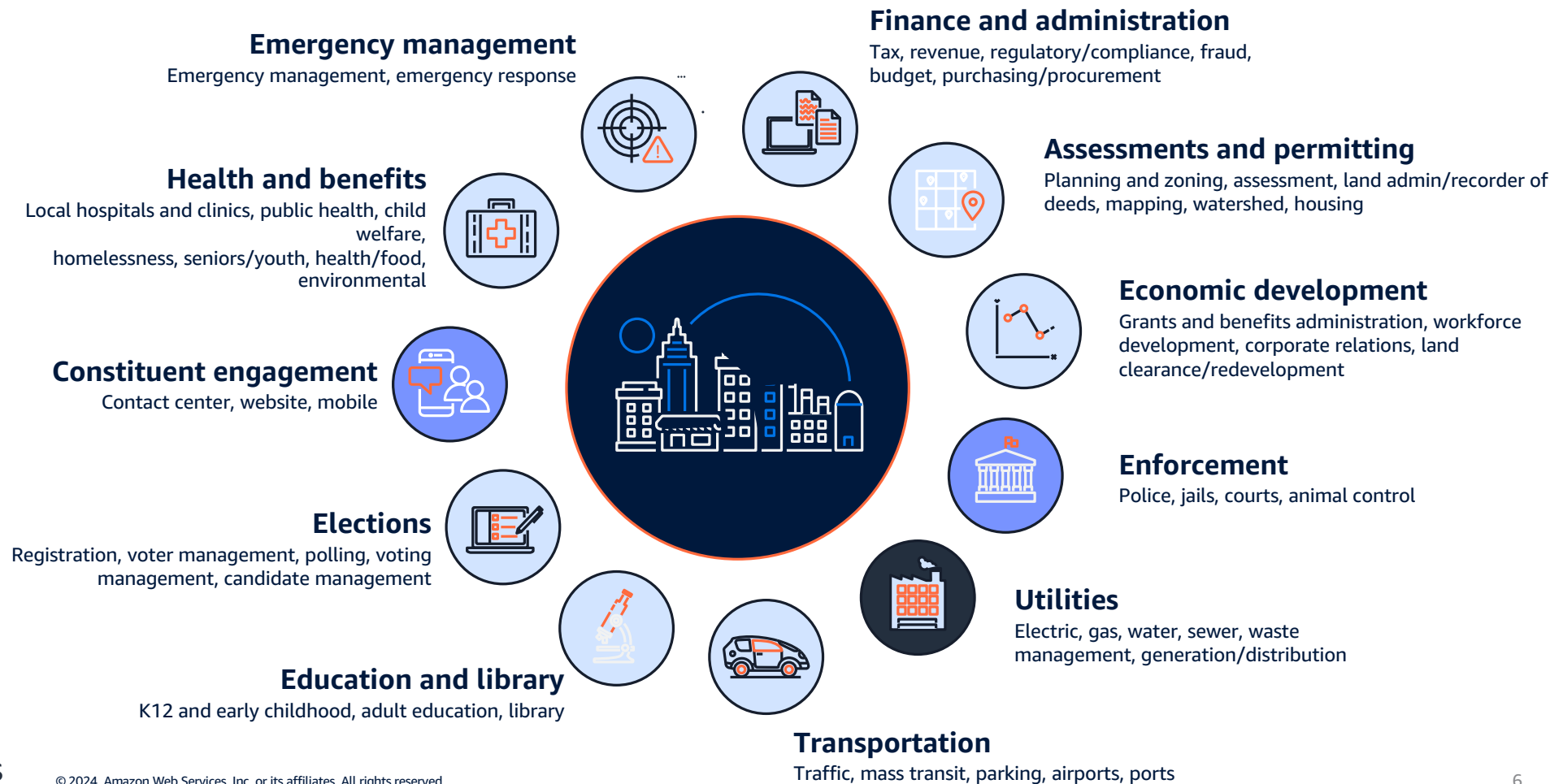


**Complex security, privacy, and compliance requirements** create barriers to change and block adoption of many SaaS solutions



**Risk averse culture** and institutional inertia slow innovation

# Machine learning is going mainstream in public sector



# 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.

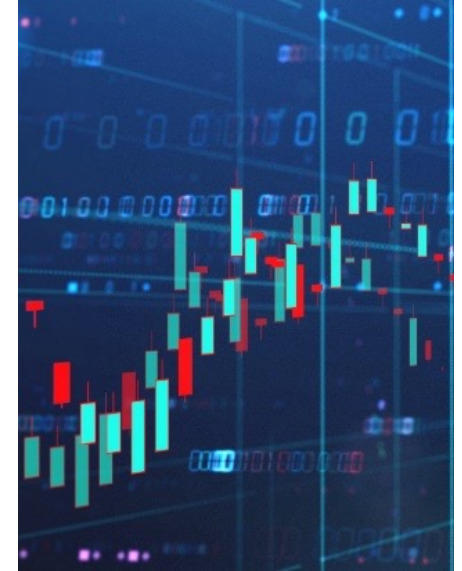
Personal Information	
Full Name:	Jane Doe
Phone Number:	555-0100
Home Address:	123 Any Street, Any Town, USA
Mailing Address:	Same as home address

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**

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



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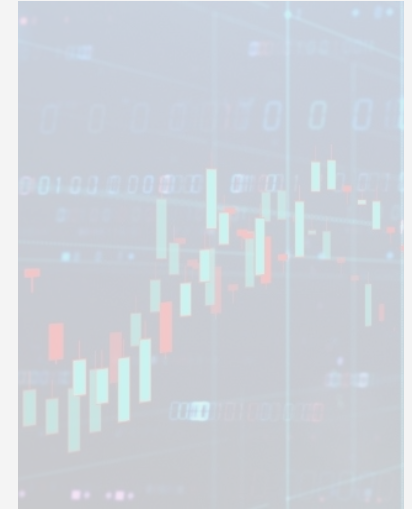
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**Intelligent document  
processing**



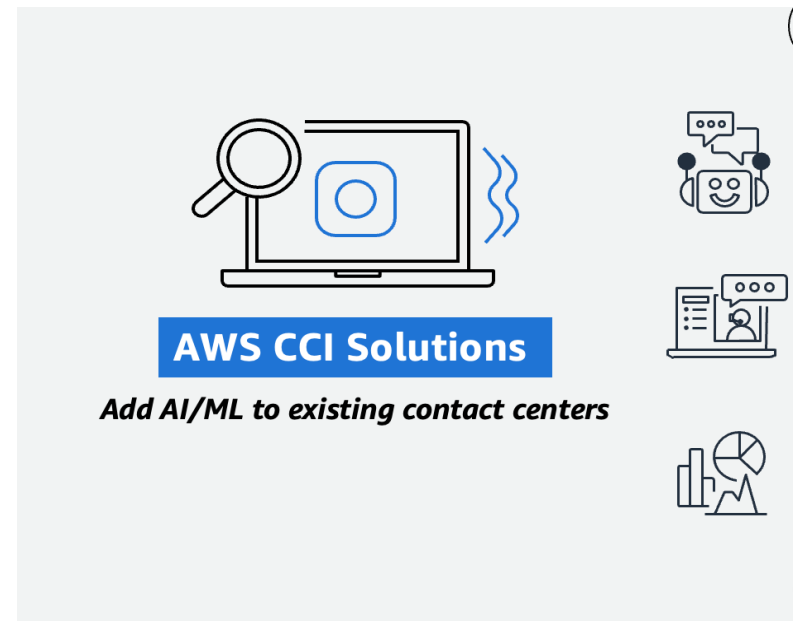
**Computer  
vision**



**Predictions  
and insights**

## 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 generative AI use cases for state and local government



Speech  
and language

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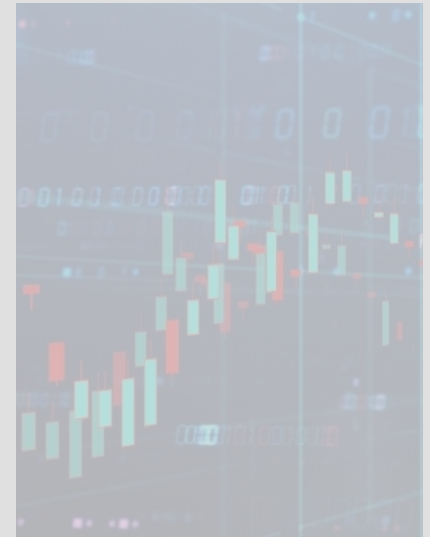
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Intelligent  
document  
processing



Computer  
vision



Predictions  
and insights



# 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."



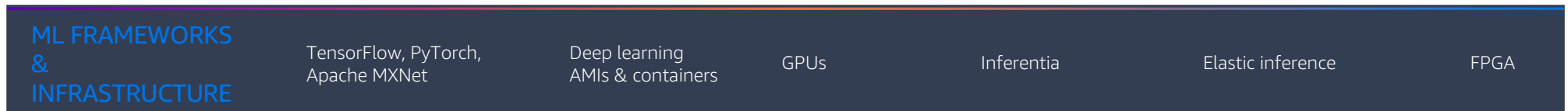
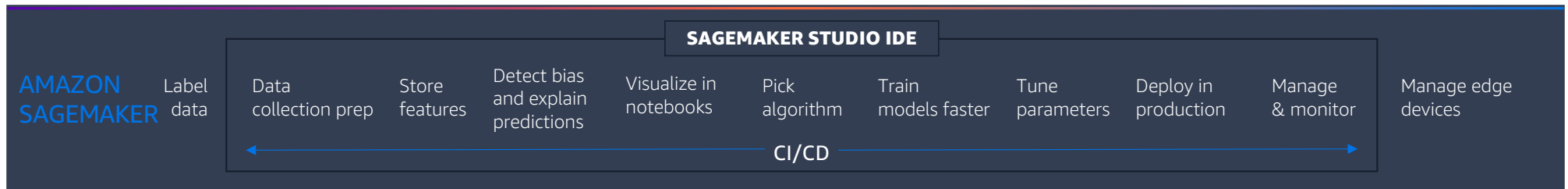
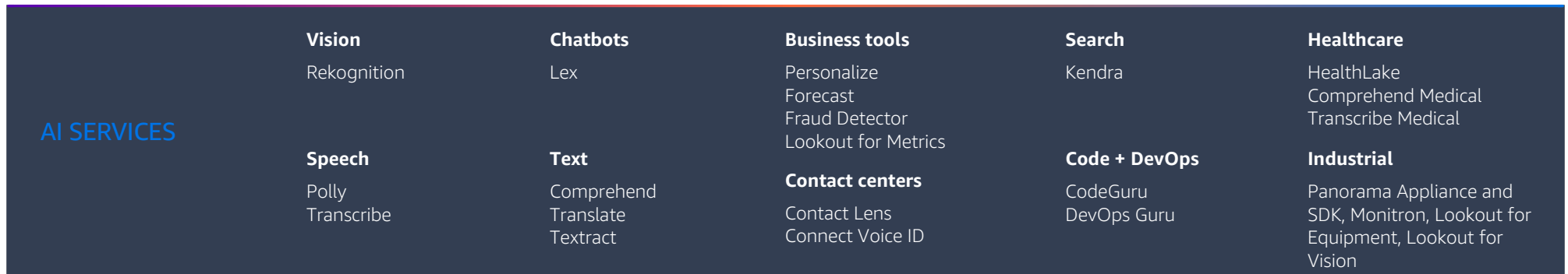
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# The AWS ML Stack

Broadest and most complete set of machine learning capabilities







# Amazon Generative AI

## 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)

# Generative AI use cases across industries

ENHANCE CUSTOMER EXPERIENCES	BOOST EMPLOYEE PRODUCTIVITY & CREATIVITY	OPTIMIZE BUSINESS PROCESSES
CHATBOTS	CONVERSATIONAL	DOCUMENT
VIRTUAL	SEARCH	PROCESSING
ASSISTANTS	SUMMARIZATION	DATA
CONVERSATION	CONTENT CREATION	AUGMENTATION
ANALYTICS	CODE GENERATION	FRAUD DETECTION
PERSONALIZATION	DATA TO INSIGHTS	PROCESS
		OPTIMIZATION







# Generative AI Application



Generative AI  
Application

# Data Foundation

STORAGE

GOVERNANCE  
& COMPLIANCE

DATABASES,  
ANALYTICS,  
& DATA LAKES

DATA  
INTEGRATION



# Your data is the **differentiator**



Generic  
generative AI



Generative AI that  
knows your business  
and your customers



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



# Security considerations for generative AI

## COMPLIANCE & GOVERNANCE

The policies, procedures, and reporting needed to empower the business while minimizing risk

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Create generative AI usage guidelines

Establish process for output validation

Develop monitoring & reporting processes

## LEGAL & PRIVACY

The specific regulatory, legal, and privacy requirements for using or creating generative AI solutions.

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Retain control of your data

Encrypt data in transit and at rest

Support regulatory standards

## CONTROLS

The implementation of security controls that are used to mitigate risk.

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Human-in-the-loop

Explainability & auditability

Testing strategy

Identity and access management

## RISK MANAGEMENT

Identification of potential threats to generative AI solutions and recommended mitigations.

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Threat modeling

Third-party risk assessments

Ownership of data, including prompts and responses

## RESILIENCE

How to architect generative AI solutions to maintain availability and meet business SLAs.

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Data management strategy

Availability

High Availability and Disaster Recovery strategy



# Generative AI Stack

## APPLICATIONS THAT LEVERAGE LLMs AND FMs



Amazon Q  
Business



Amazon Q  
Developer



Amazon Q in  
QuickSight



Amazon Q in  
Connect



Amazon Q in  
AWS Supply Chain

## TOOLS TO BUILD WITH LLMs AND OTHER FMs



Amazon Bedrock

Guardrails

Agents

Studio

Customization Capabilities

Broadest selection of models

## INFRASTRUCTURE FOR FM TRAINING AND INFERENCE



GPUs



Trainium



Inferentia



SageMaker



UltraClusters

EFA



EC2 Capacity Blocks



Nitro



Neuron

# Demos

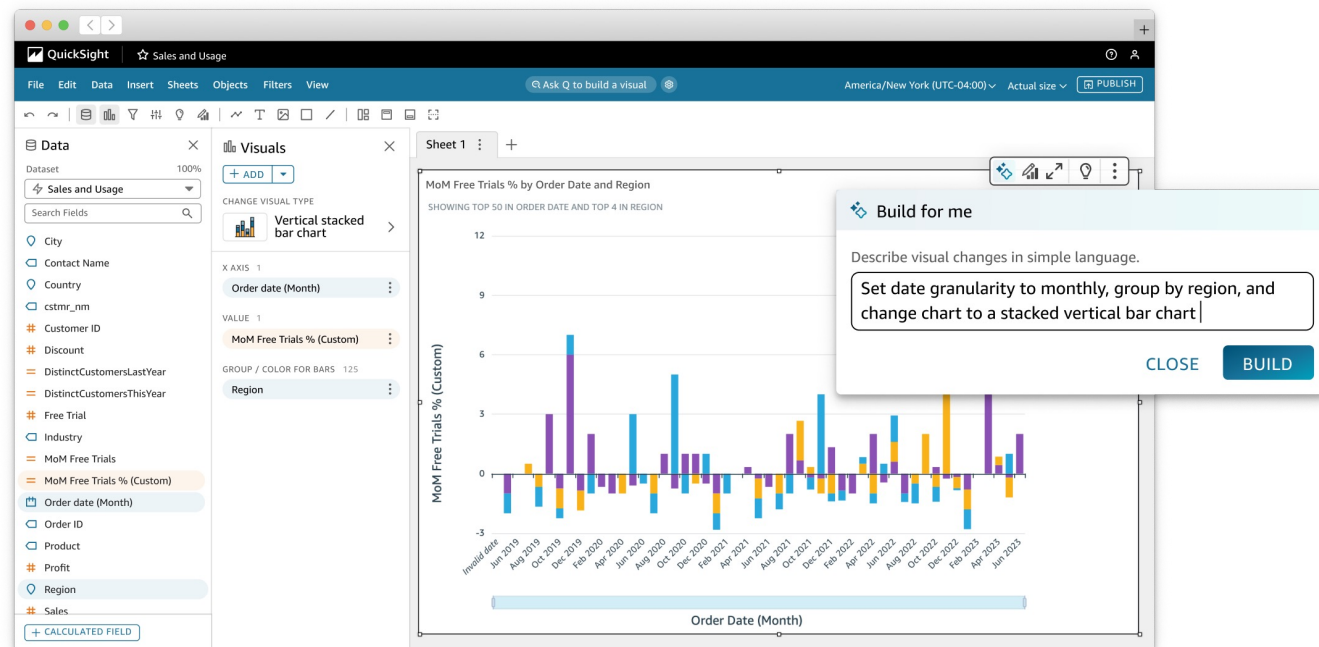


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# Visual authoring in QuickSight

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





## Data X

Dataset 100%

SaaS-Sales\_2023

Search Fields

- City
- Contact Name
- Country
- cstmr\_nm
- Customer ID
- Discount
- DistinctCustomersLastYear
- DistinctCustomersThisYear
- Free Trial
- Industry
- MoM Free Trials
- MoM Free Trials %
- Order date
- Order ID
- Product
- Profit
- Region
- Sales

+ CALCULATED FIELD

## Sheet 1 +

## Sales

## YTD sales

\$189,948

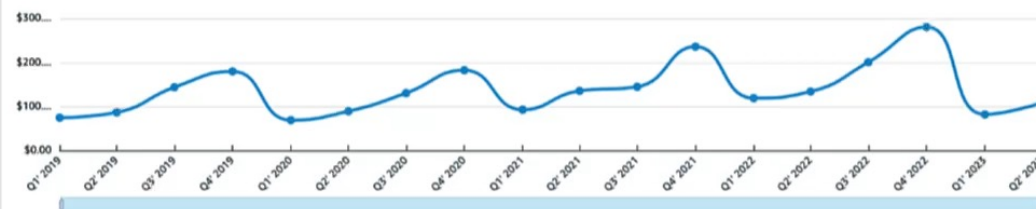
## Sales last quarter

\$81,908

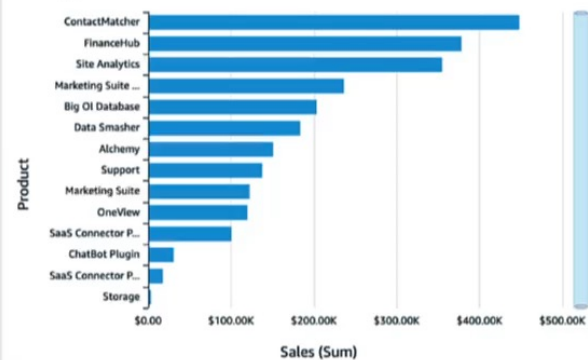
## Month-over-month sales

Sales for Jun 2023  
increased by 97.41%  
(\$22,188.88) from  
\$22,779.48 to  
\$44,968.36.

## Quarterly sales trend



## Sales by product

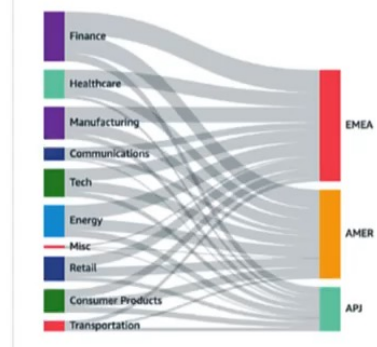


## Sales by city

SHOWING TOP 255 IN CITY AND TOP 2 IN SEGMENT



## Product sales by industry



## Usage

## Usage

MTD usage sessions

## Active customers

MTD

## Trial sign-ups

MTD

## Month-over-month usage

Total Usage Sessions for Jun 2023

## Product usage by industry



# Make generative AI work with **your data**



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## RETRIEVAL-AUGMENTED GENERATION (RAG)

Specialized knowledge through prompt augmentation

Enterprise knowledge corpus

No change to the foundation model



## FINE-TUNING

Specialized knowledge for specific tasks

Small number of labeled examples

Change a copy of the foundation model



## CONTINUED PRE-TRAINING

Generalized and specialized knowledge for your domain

Unlabeled, unstructured enterprise data

Change a copy of the foundation model

# Responsible AI Dimensions

## **FAIRNESS**

Considering impacts on different groups of stakeholders

## **EXPLAINABILITY**

Understanding and evaluating system outputs

## **CONTROLLABILITY**

Having mechanisms to monitor and steer AI system behavior

## **SAFETY**

Preventing harmful system output and misuse

## **PRIVACY & SECURITY**

Appropriately obtaining, using and protecting data and models

## **GOVERNANCE**

Incorporating best practices into the AI supply chain, including providers and deployers

## **TRANSPARENCY**

Enabling stakeholders to make informed choices about their engagement with an AI system

## **VERACITY & ROBUSTNESS**

Achieving correct system outputs, even with unexpected or adversarial inputs

# Responsible AI: Best practices



Put your people first



Assess risk on a (use) case-by-case basis



Iterate across the AI lifecycle



Test, test again, and then test again





# Thank you!

## **Sergio Ortega**

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**Artificial Intelligence**  
Generative AI for Public Sector

