

# AWS State, Local, and Education Learning Days

North Carolina

# Building AI and ML powered applications without machine learning expertise

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AWS

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**At AWS, our goal is to put machine learning  
in the hands of business teams**



Enhance  
customer  
experience



Augment human  
ingenuity

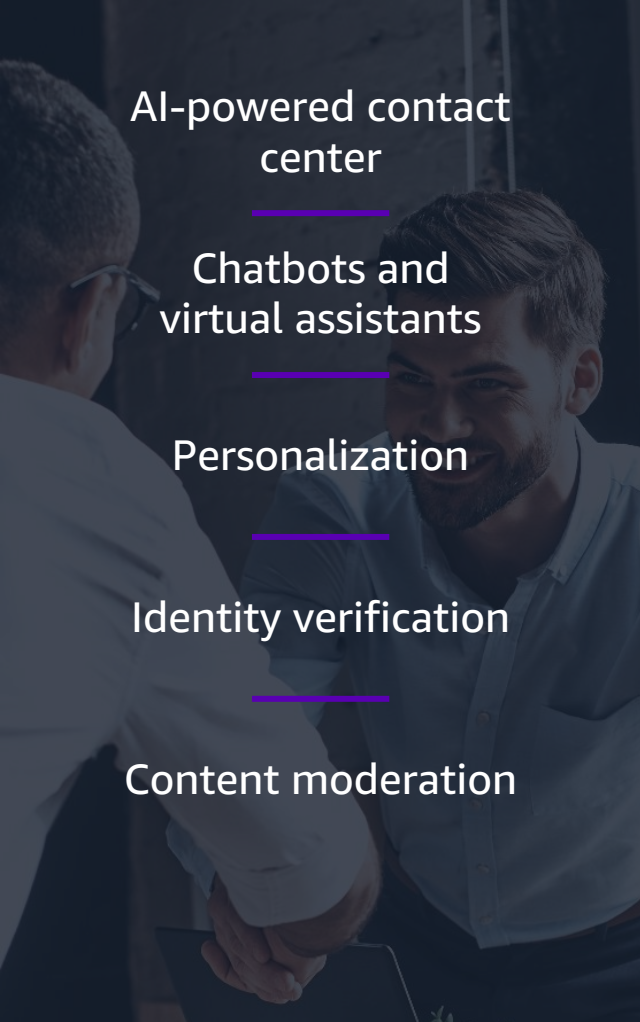


Improve business  
operations



New products  
and services





AI-powered contact  
center

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Chatbots and  
virtual assistants

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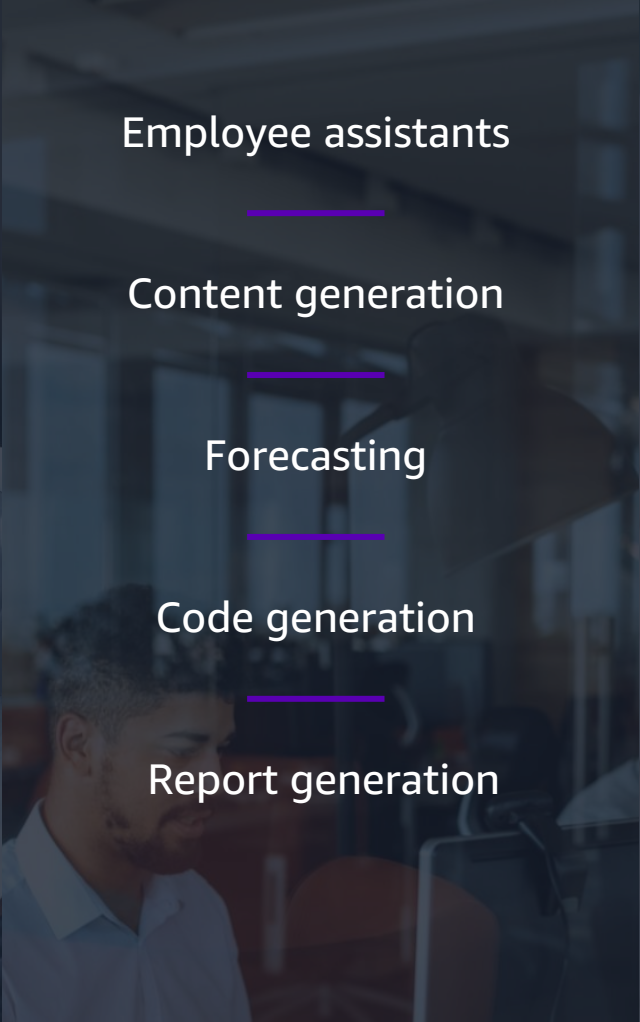
Personalization

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Identity verification

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Content moderation



Employee assistants

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Content generation

---

Forecasting

---

Code generation

---

Report generation



Document processing

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Fraud preventions

---

Predictive maintenance

---

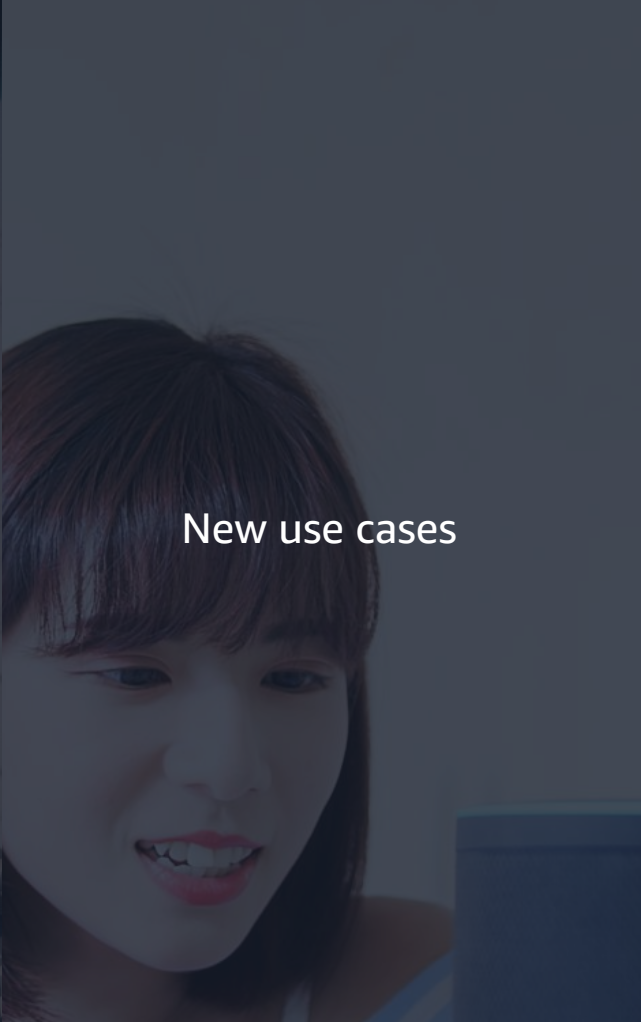
Machine translation

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Visual inspection

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Process optimization



New use cases

Enhance  
customer  
experience

Boost Employee  
Productivity

Improve business  
operations

New products  
and services

# Low-code/ No-code AWS AI/ML services

EASILY ADD INTELLIGENCE TO YOUR BUSINESS APPLICATIONS

AI SERVICES

SPECIALIZED

BUSINESS PROCESSES

Amazon Personalize

Amazon Forecast

SEARCH

Amazon Kendra

CONVERSATION

Amazon Lex

Moderation

Amazon Augmented AI

CORE

TEXT

Amazon Translate

Amazon Comprehend

SPEECH

Amazon Polly

Amazon Transcribe

VISION

Amazon Textract

Amazon Rekognition

AWS Panorama

ML Services

AMAZON SAGEMAKER CANVAS

No-code ML for business analysts

Generative AI

AMAZON Bedrock Studio

Build Gen AI applications faster and more securely

Amazon Q

A gen AI-powered assistant

Amazon Q Business

Amazon Q Developer

Amazon Q in QuickSight

Amazon Q in Connect

AI Enhanced Services

AMAZON CONNECT

AI Enhanced Contact center

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# Example use cases

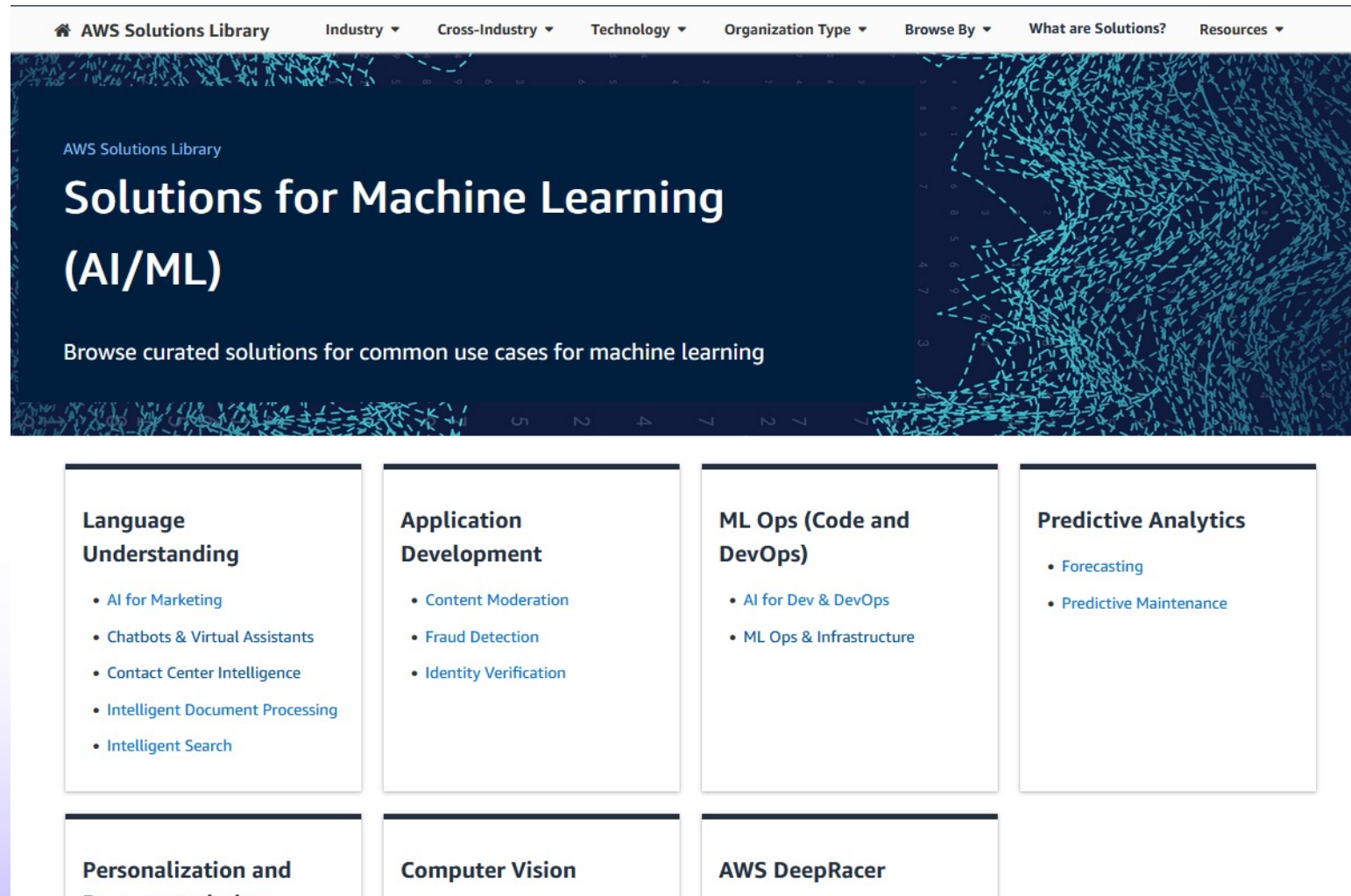
Conversational AI

Intelligent Search

Identity Verification

Intelligent Document Processing (IDP)

# AWS AI/ML solutions library



[aws.amazon.com/solutions/ai-ml/](https://aws.amazon.com/solutions/ai-ml/)



# Conversational AI

- Voice and text-based interfaces to enhance end user experience and increase customer satisfaction

## Use case categories

- Self-service bots
- Virtual agents and assistants
- Transactional bots
- Proactive help based on usage behavior

## Benefits

- Enable new ways of engagement
- Increase customer satisfaction
- Reduce operational costs
- Streamline business processes

## Underlying AI services



Amazon  
Lex



Amazon  
Polly



Amazon  
Kendra



Amazon  
Comprehend



Amazon  
Translate  
Machine  
translation

## Solution

QnABot on AWS

# Intelligent search

- Get the most out of your data with Intelligent Search

## Use case categories

- Improve customer interactions
- Accelerate research and development
- Minimize regulatory & compliance risks
- Equip employees with the data they need

## Benefits

- Find answers faster across unstructured content
- Boost workforce productivity
- Enhance customer experiences
- Centralize access to knowledge

## Underlying AI services



Amazon  
Kendra

# Identity verification

- Enable secure and compliant digital experiences

## Use case category

- Citizen Identity Verification
- Healthcare and Social Services
- Education and Student Services
- Customer onboarding & verification
- Online proctoring

## Benefits

- Reduce onboarding friction
- Reduce fraud
- Lower costs and overheads

## Underlying AI services



Amazon  
Rekognition



Amazon  
Textract  
Intelligent Text  
Extraction

## Guidance

[Guidance for Identity Verification](#)

# Intelligent document processing

- Make faster decisions by automatically extracting and analyzing data from documents

## Use case categories

- Insurance forms text extraction
- Mortgage applications data extraction
- Medical forms processing
- Financial

## Benefits

- Higher accuracy of data
- Faster data processing
- Improve employee productivity
- Cost savings

## AI services



Amazon  
Comprehend



Amazon  
Textract  
Intelligent Text  
Extraction



Amazon  
Augmented AI

## Solution

Document understanding solution

## Solution

Extract and analyze  
data from documents



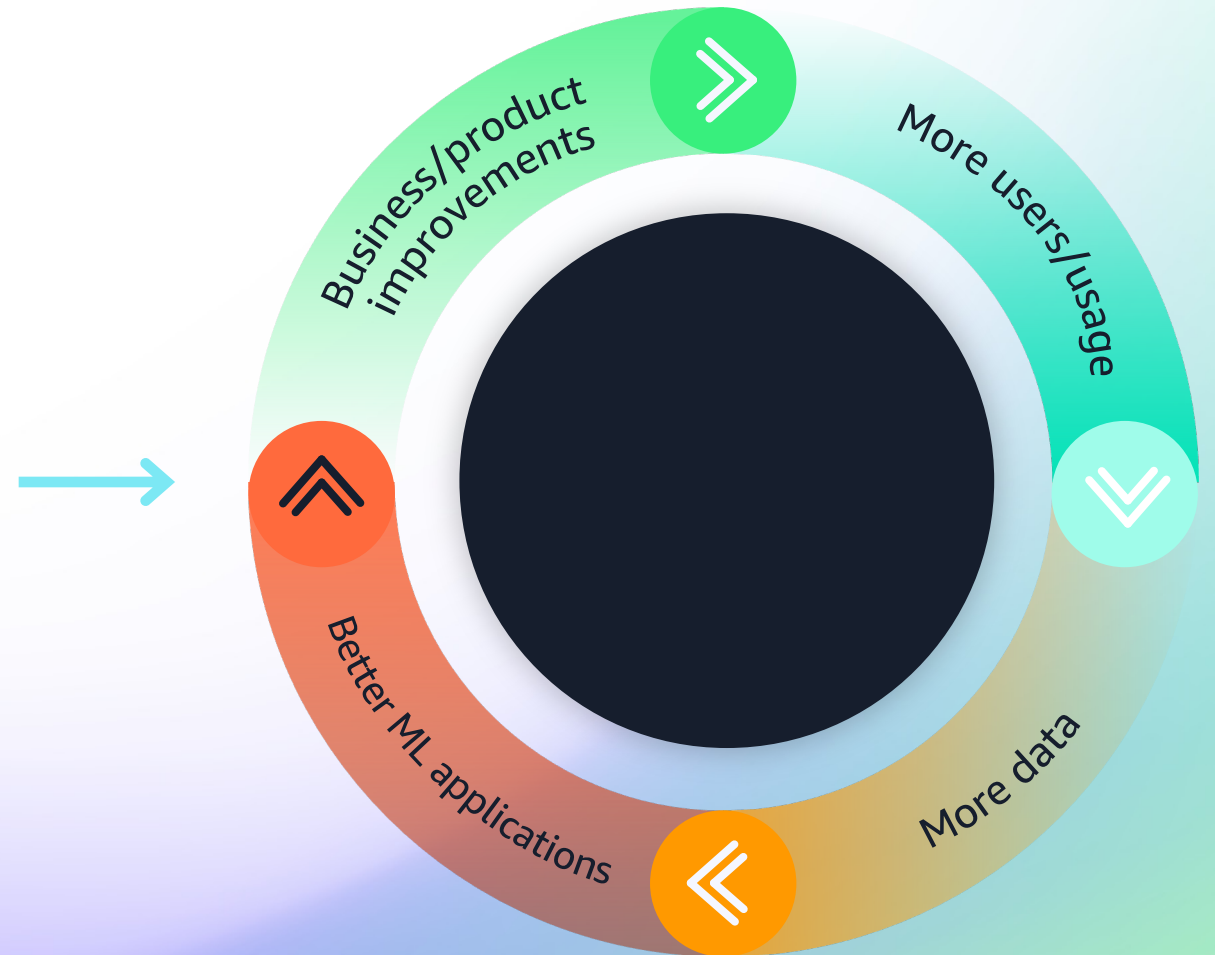
# Amazon SageMaker Canvas

# Building practical ML applications is hard

## The bottleneck

**BUILDING BETTER ML APPLICATIONS CAN BE THE BOTTLENECK BECAUSE:**

- Line of business teams depend on data science teams to make ML powered decisions
- Data science teams are oversubscribed, while ML needs are only increasing
- High learning curve for technical users to learn how to code
- Friction points in the machine learning journey and prioritizing use cases



# Ready-to-use ML models powered by AWS AI services

- Foundation Models
- Intelligent document processing
- Natural Language processing
- Computer Vision

The screenshot displays the AWS AI services console interface. At the top, there is a search bar labeled 'Search use case' and a link 'Can't find the right model? Create a custom model'. Below this, the 'Generative AI-powered foundation models' section is highlighted, featuring a card for 'Generate, extract and summarize content' powered by Amazon Bedrock. The 'Additional ready-to-use models' section follows, with a filter for 'Text' data type. This section contains ten cards for various models: Document queries, Document analysis, Sentiment analysis, Language detection, Object detection in images, Identity document analysis, Expense analysis, Entities extraction, Personal information detection, and Text detection in images. Each card includes a brief description of the model's function and the AWS service it is powered by (Amazon Texttract or Amazon Comprehend).

Search use case

Can't find the right model? [Create a custom model](#)

**Generative AI-powered foundation models**  
Our content generation models can help you craft engaging narratives, articles, answer questions, and more, tailored to your needs.

**Generate, extract and summarize content** New  
Powered by Amazon Bedrock and publicly available models

**Additional ready-to-use models**  
Our ready-to-use content extraction models can quickly distill insights from text, image, and document data.

Filter by data type: Text Image Document

- Document queries**  
Extract information from structured documents such as paystubs, bank statements, W-2s, and mortgage application forms by asking questions using natural language.  
Powered by Amazon Texttract
- Document analysis**  
Analyze documents and forms for relationships among detected text.  
Powered by Amazon Texttract
- Identity document analysis**  
Extract information from passports, driver licenses, and other identity documentation issued by the US Government.  
Powered by Amazon Texttract
- Expense analysis**  
Extract information from invoices and receipts, such as date, number, item prices, total amount, and payment terms.  
Powered by Amazon Texttract
- Sentiment analysis**  
Detect sentiment in lines of text, which can be positive, negative, neutral, or mixed.  
Powered by Amazon Comprehend
- Entities extraction**  
Extract entities, which are real-world objects such as people, places, and commercial items, or units such as dates and quantities, from text.  
Powered by Amazon Comprehend
- Language detection**  
Determine the dominant language in text such as English, French or German.  
Powered by Amazon Comprehend
- Personal information detection**  
Detect personal information that could be used to identify an individual, such as addresses, bank account numbers, and phone numbers, from text.  
Powered by Amazon Comprehend
- Object detection in images**  
Detect objects, concepts, scenes, and actions in your images.  
Powered by Amazon Rekognition
- Text detection in images**  
Detect text in your images.  
Powered by Amazon Rekognition

# Prepare data

- 50+ data connectors
- Rich data insights powered by ML
- Built-in visualizations
- 300+ build-in transforms

The screenshot displays the Amazon SageMaker Canvas interface, which is used for preparing data and building machine learning models. The interface is divided into several sections:

- Data Wrangler: Data flow**: Shows the data source as 'House-loan.flow' and 'canvas-sample-loans-part-1.csv'.
- Data quality and insights report: DQI-before**: Provides a summary of data quality, including target column, type, dataset, and date.
- Summary**: Displays the model being built, 'My models / Lab 1 - Churn / Version 2', and the target column 'Churn'.
- Model type**: Shows the model type as '2 category prediction' and the model's output as 'Your model classifies Churn into two categories.'
- ChurnData**: A table showing the data used for the model, with columns for 'Vmail\_Plan', 'Vmail\_Me...', 'State', 'Phone', and 'Night\_Mi'.
- Add transform**: A sidebar on the right with various transforms like 'Manage columns', 'Change data type', 'Custom formula', 'Replace missing values', 'Replace outlier values', 'Manage rows', 'Drop duplicate rows', and 'Drop rows by formula'.

Vmail_Plan	Vmail_Me...	State	Phone	Night_Mi
yes	300	PA	403-2562	4.065759457
no	0	SC	158-8416	7.141039871
yes	300	MO	896-6253	5.363234681
yes	700	WY	817-5729	3.773585578
no	0	WY	450-4942	3.751673372
no	0	VA	454-9110	2.937879986
no	0	IN	331-5751	2.352273897
no	0	LA	871-3612	0.688785147
no	0	MO	249-5723	4.208352014



# Amazon Q

# Amazon Q, a generative AI powered assistant from AWS

AMAZON Q DEVELOPER



AMAZON Q BUSINESS

## Embedded

Amazon Q  
In Connect

Amazon Q  
In QuickSight

Amazon Q in  
AWS Supply Chain

## Benefits

In-built privacy and security

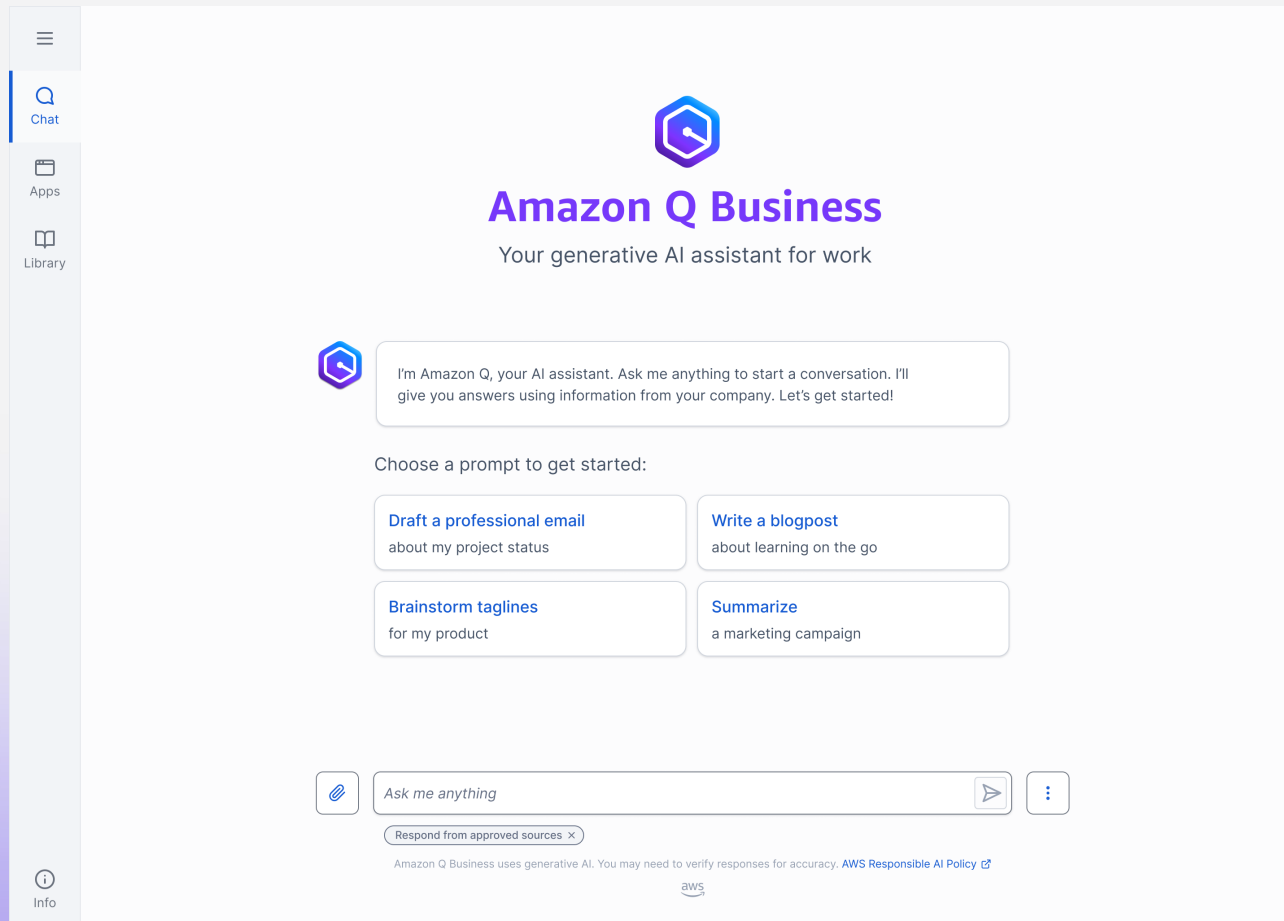
Customizable to your business

# Amazon Q Business

The generative AI assistant that empowers employees with your organization's knowledge and data

# Amazon Q Business overview

BOOST YOUR WORKFORCE PRODUCTIVITY WITH GENERATIVE AI



Delivers quick, accurate, and relevant answers to your business questions, securely, and privately

Execute actions using out-of-the-box or custom plugins

Respects existing access control based on user permissions

Connects to over 40 popular enterprise applications and document repositories

Enables administrators to easily apply guardrails to customize and control responses

Streamlines daily tasks with user-created lightweight applications



# Amazon Q Apps

EASILY BUILD AND SHARE CUSTOMIZED, SECURE, LIGHTWEIGHT APPLICATIONS

The screenshot displays the Amazon Q Apps interface. On the left is a sidebar with icons for 'Chat', 'Apps' (selected), and 'Library'. The main area features the 'Outreach Assistant' app, which generates tailored customer outreach emails. The app's header includes the Amazon Q logo and a 'Customize' button. Below the header are three text input fields: 'Company' (with placeholder 'Enter company name'), 'Product' (with placeholder 'Enter product name'), and 'Account manager' (with placeholder 'Enter account manger name'). Below these are two sections: 'File upload' (with a file named 'Ideal email.docx' and a 'Browse for files' link) and 'Outlook connector' (with a status 'Generating as soon as Company, Product, and Account manager are populated'). At the bottom, there is a 'Jira plugin' section titled 'Related Jira stories' and a 'Run' button with a play icon. A status bar at the very bottom indicates 'Generating as soon as Email message is'.

Easily convert an Amazon Q conversation into a lightweight application or describe what you want to build using natural language

Employees can share their applications with other employees or publish them to the organization's catalog for others to use as is, or modify them to their particular needs

Leverages your enterprise data through Amazon Q 40+ connectors

Inherits Amazon Q security and governance controls, including user authentication and access controls

# Amazon Q: Secure and private by design

YOUR DATA IS YOUR DIFFERENTIATOR



**Respects existing governance identities, roles, and permissions,**  
personalizing interactions accordingly



When you sign up for Amazon Q Developer Pro or Amazon Q Business, **we don't use content to improve underlying models for others**

# Amazon Q Developer

Reimagine the experience across the entire software development lifecycle

# Amazon Q Developer



Reimagines the experience across the entire software delivery lifecycle

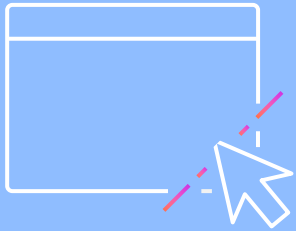
Helps developers and IT professionals build and manage secure, scalable, and highly available applications

Helps you write, debug, test, optimize, and upgrade your code faster

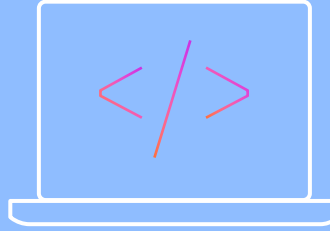
Converses with you to explore new AWS capabilities, learn unfamiliar technologies, and architect solutions

**Amazon Q is built with security and privacy in mind from the start, making it simpler for organizations to use generative AI safely.**

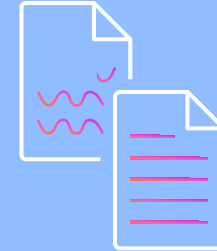
# Amazon Q is available where you do your work



**AWS consoles**



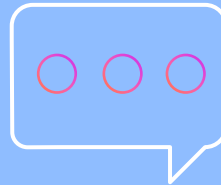
**IDEs**



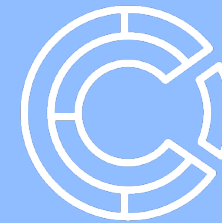
**AWS documentation**



**AWS Console  
Mobile Application**



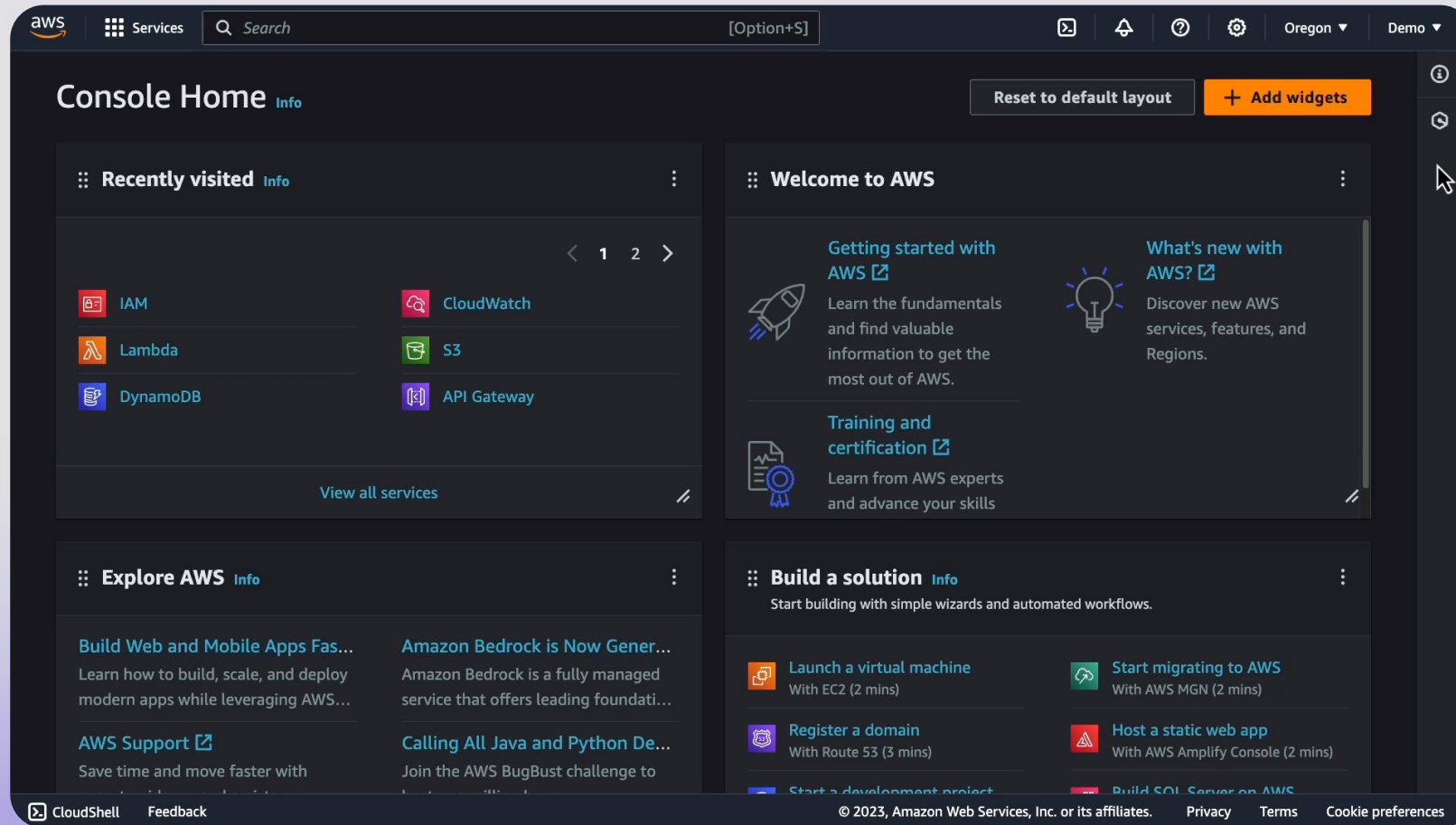
**Slack and Teams  
(through AWS Chatbot)**



**Amazon  
CodeCatalyst**



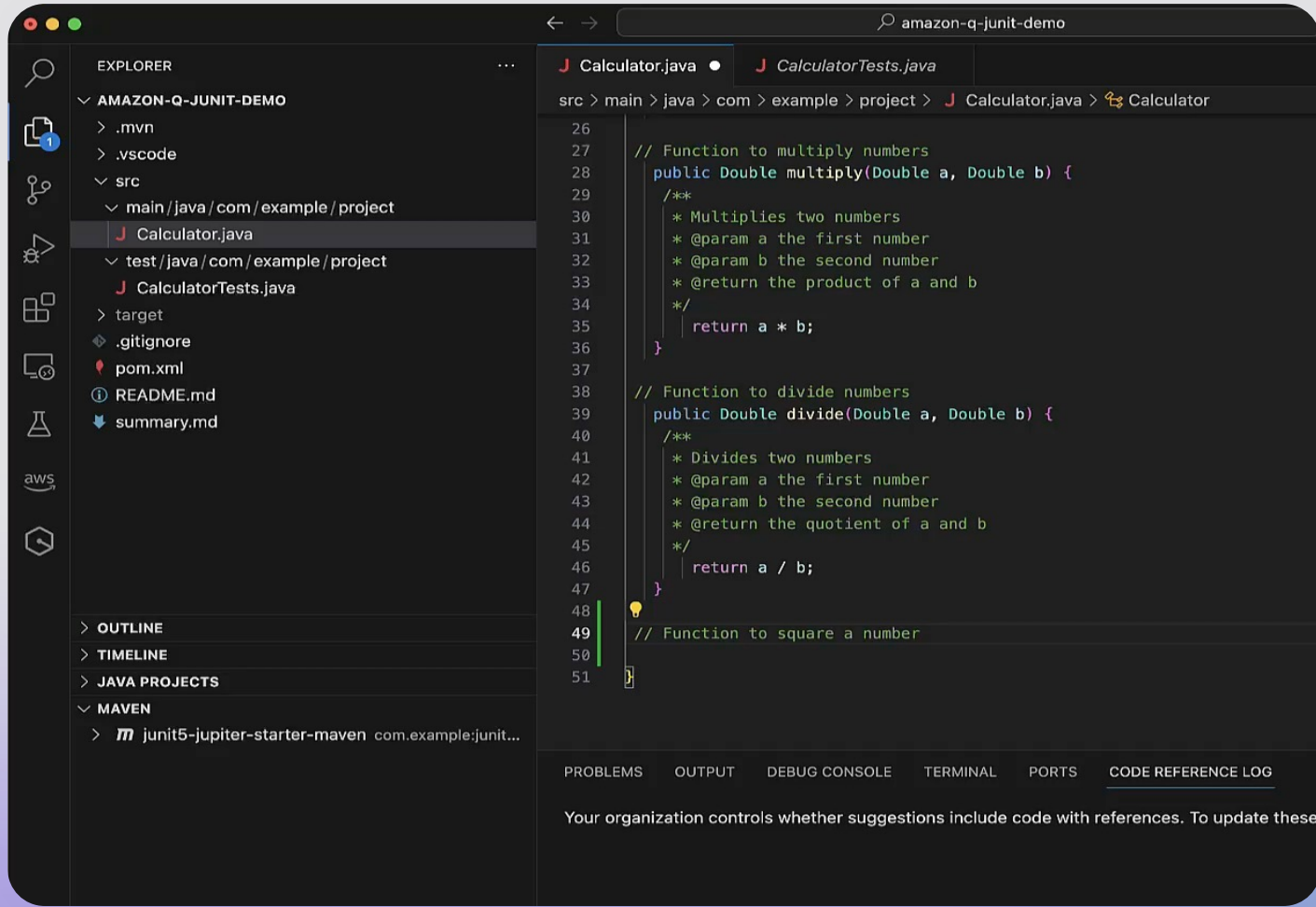
# Explore and plan



Ask questions and get guidance from 17 years of AWS knowledge, best practices, and well-architected advice

Create a business-expert application using your data, systems, and more.

# Create



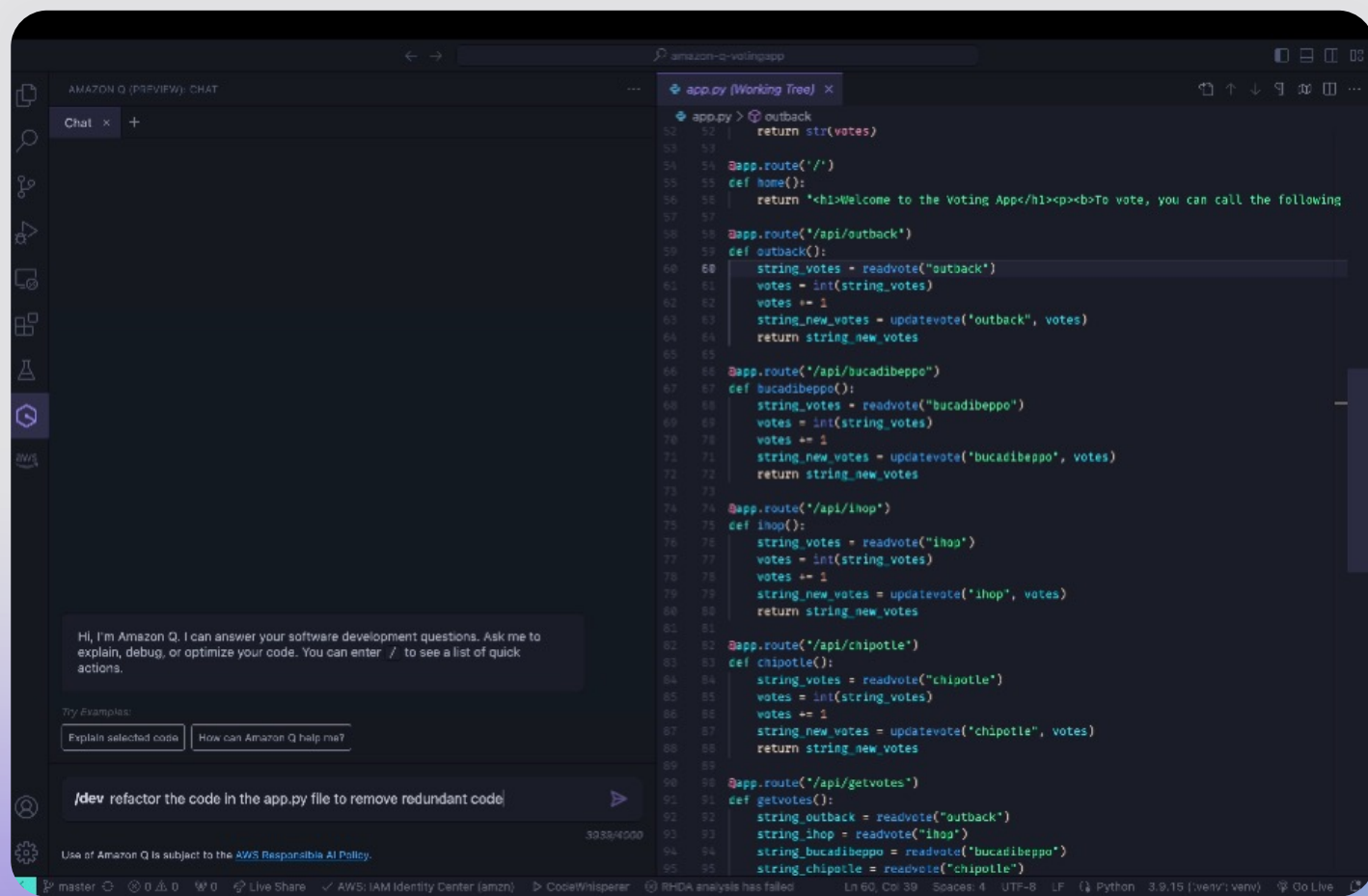
Generate code

Explain code

Help understand  
your code base

Customizable  
to your code

# Create: Advanced capability: Amazon Q Developer agent for software development



Write and implement entire application features in minutes right from a simple natural language prompt in your IDE

Interactive step-by-step instructions, code, tests, and best practices

# Amazon Q supports developers across the SDLC

## Plan

- Amazon Q in Console (best practices, AWS Web Application Firewall (WAF), Amazon Elastic Compute Cloud (EC2) instance optimization, etc.)
- Business-specific application

## Create

- In-line coding companion in integrated development environment (IDE) and Command Line Interface (CLI)
- Feature development
- Chat in IDE

## Test and secure

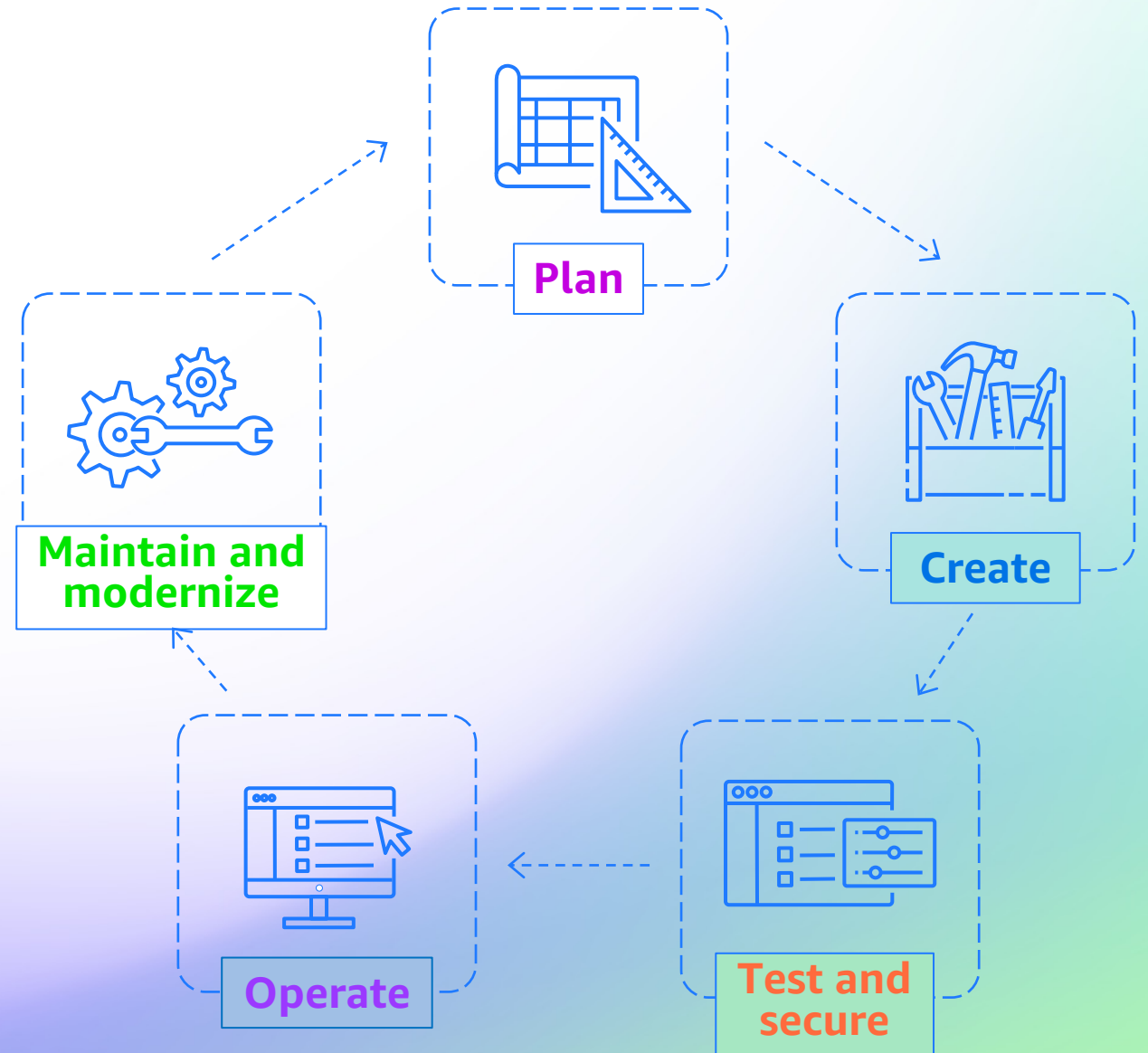
- Unit test generation
- Security scanning and remediation

## Operate

- Troubleshoot errors (Simple Storage Service (S3), Lambda, EC2, Elastic Kubernetes Service (EKS))
- Virtual Private Cloud (VPC) Reachability Analyzer

## Maintain and modernize

- Modernize code with Q Code Transformation



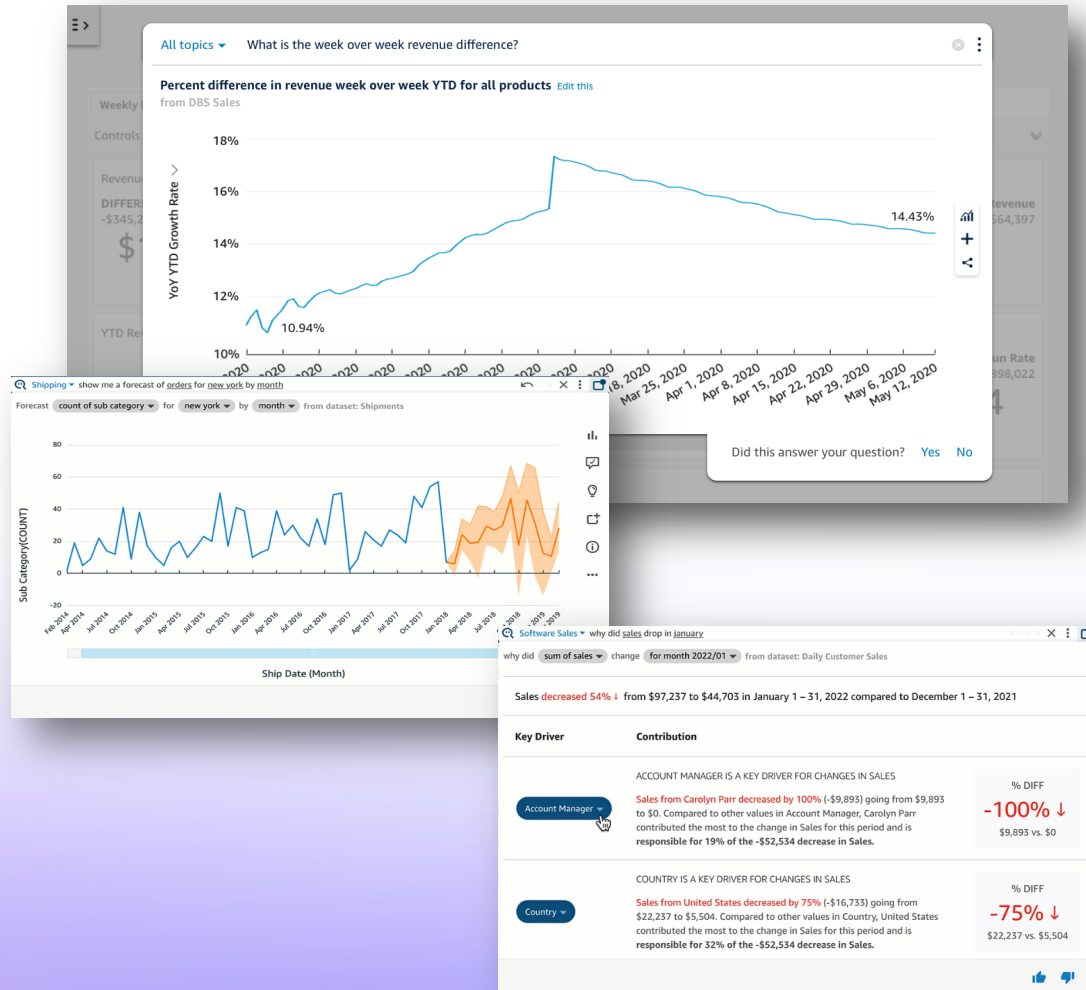
# Amazon Q in QuickSight

A new generative AI assistant for BI



# Foster a data-driven culture with Q

SELF-SERVICE INSIGHTS FOR ANYONE USING ML-POWERED NLQ



- Ask questions in natural language
- ML-models interpret user question and intent to generate visualization
- AI-enhanced automated data preparation accelerates time-to-value

## Forecast

- See what's likely to happen
- See future trajectories for up to 3 measures simultaneously

## Ask 'Why'?

- Identify key drivers to changes in the data with contribution analysis
- Quantify contribution by each driver

# AWS App Studio

# AWS App Studio

The Fastest and Easiest Way  
to Build Business Applications

Preview

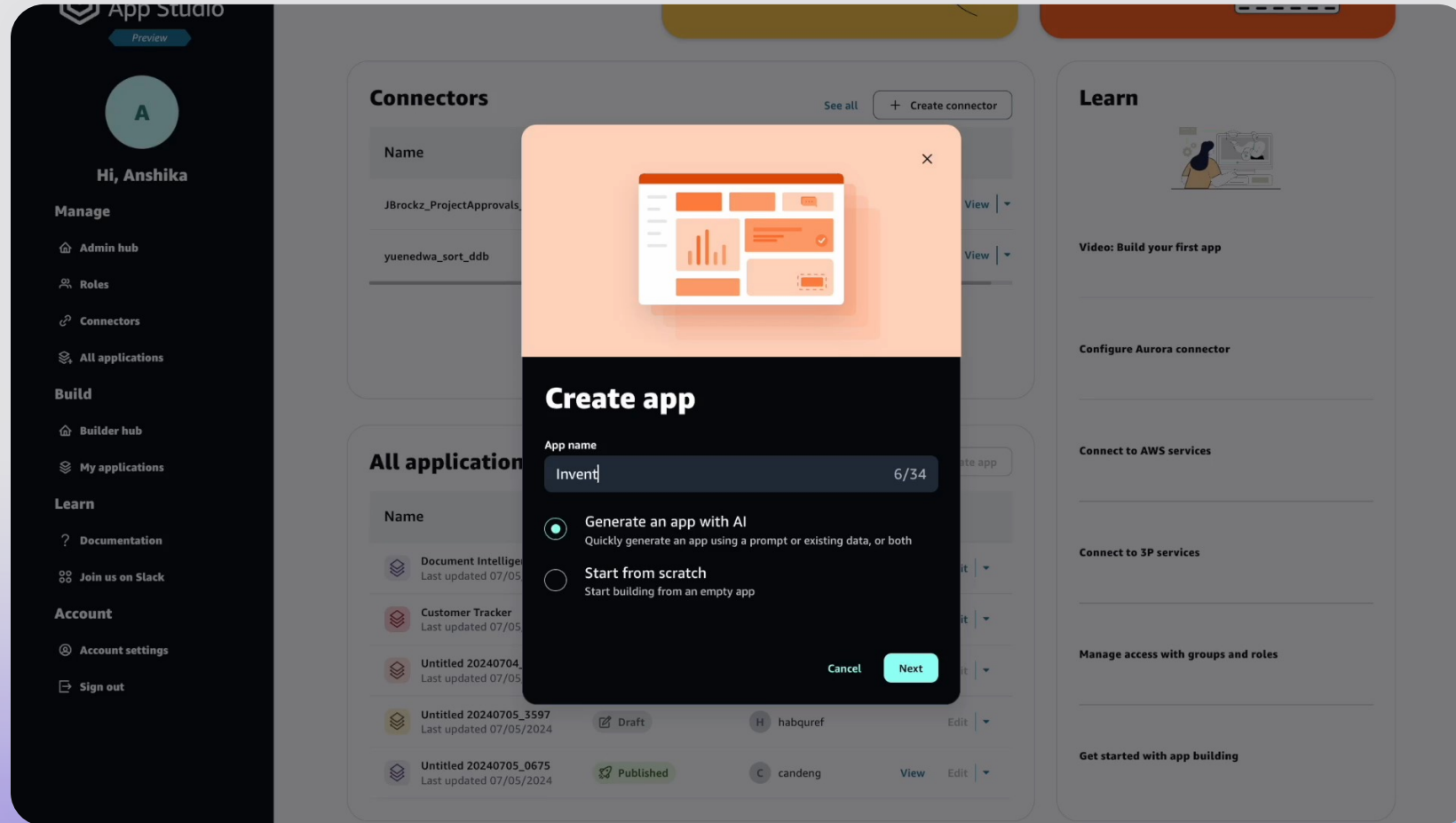
Accelerate app development with a  
generative AI-powered assistant

Deploy **highly scalable** applications  
without operational overhead

Enhance **security** and **governance**  
that delights IT

Save up to **80%** vs.  
comparable offerings

# Accelerate application creation with a generative AI-powered assistant



Describe the application you need, the generative AI-powered assistant will generate the full application, including UI, data models, and business logic.

Low-code environment with drag-and-drop canvas and AI helpers to customize UI, functionality, and roles, without professional software development skills.

# Connect to your data seamlessly

**App Studio**  
Preview

Hi, TestUser1

**Manage**

- Admin hub
- Roles
- Connectors**
- All applications

**Build**

- Builder hub
- My applications

**Learn**

- Documentation
- Join us on Slack

**Account**

- Account settings

Admin hub > Connectors

## Connectors (4)

Search connectors

+ Create connector

Name	Description	Connected to	Created by
Invoice Processing	Sample DB for Invoice processing	Amazon DynamoDB	d801f3d0-40a1-70f2-e898-5caaca4599f7
Send Email (Amazon Simple Email Service)	Test connector for sending email through SES	Simple Email Service	d801f3d0-40a1-70f2-e898-5caaca4599f7
Document Intelligence (Amazon S3)	Test connector for viewing and uploading files	S3	d801f3d0-40a1-70f2-e898-5caaca4599f7
Inspections Management (Amazon Aurora)	Demo DB with field service test data	Amazon Aurora	d801f3d0-40a1-70f2-e898-5caaca4599f7

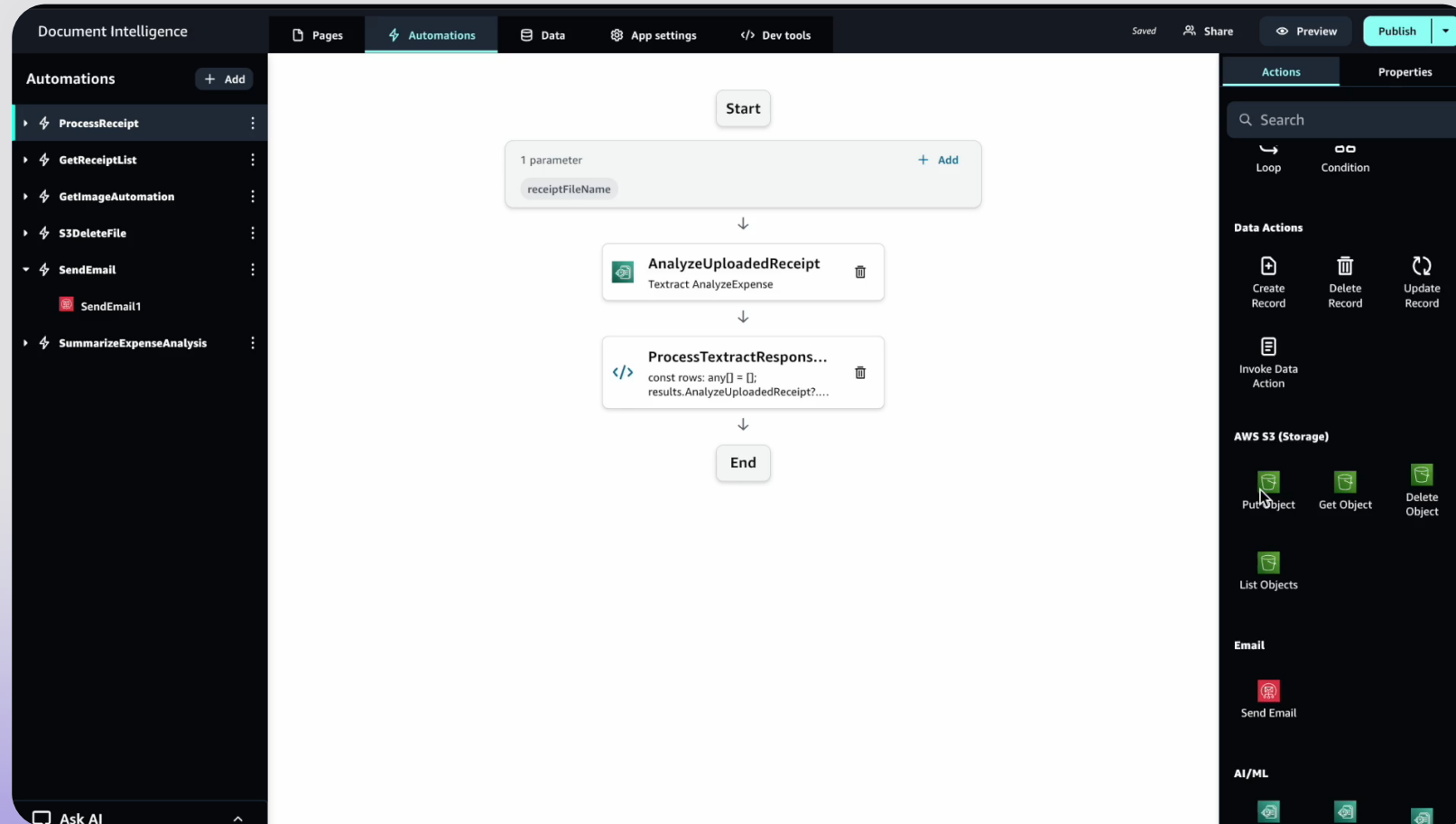
A large selection of pre-built connectors for seamless integration with your enterprise data sources.

Easily connect to AWS services like DynamoDB, RDS, Redshift, S3, and 200+ others.

API and OpenAPI connectors to integrate with hundreds of third-party services, including Salesforce.

Per-user authentication for integrating with third-party SaaS applications.

# Extend with custom functionality



Visually define business logic for your application, using a sequence of actions connected to the underlying data stores and services.

Enabling you to extend the capabilities of your applications by incorporating complex business logic tailored to your needs, unlocking a wide range of possibilities.



# Publish and share applications with ease

The screenshot shows the 'Environments' tab in the AWS App Studio interface. At the top, there's a navigation bar with 'Document Intelligence', 'Pages', 'Automations', 'Data', 'App settings', 'Dev tools', 'Saved', 'Share', 'Preview', and a 'Publish' button. Below the navigation bar, the 'Environments' tab is selected, and the 'Version history' tab is also visible. The main heading is 'Publish your app'. Below this, a text block states: 'AWS App Studio provides three environments for your app: Development, Testing, and Production.' A warning box follows: 'Your published app will be paused after a period of inactivity. In the Testing environment, an app will be paused after 3 hours of inactivity. In the Production environment, an app will be paused after 14 days of inactivity. Paused versions of the app will be securely stored in the Version History tab and can be re-published at any time. This is designed to optimize resource usage within our preview service offering.'

The workflow is shown as a sequence of three environment cards:

- Development** (Latest): This environment provides a secure sandbox environment isolated from any production services and data sources for building and modifying applications. In this environment, you can utilize the sample data stored within AWS App Studio and test your progress instantly using Preview.
- Testing** (Version 20.0): Once your initial app development is complete, you can publish to the testing environment. Here you can connect to any live production data sources, test integrations, and perform comprehensive testing including user acceptance testing (UAT) by providing access to end users. Your initial publish may take up to 15 minutes. A 'Publish' button is shown with an arrow pointing to the Testing environment. Below the card, the URL is: <https://884a021f0f-Testing.internal.studio.gamma.sequoia.aws.dev>.
- Production** (Version 18.0): After exhaustive testing in the previous environment, you can promote a version of your application to the production environment for live operational use by end users. A 'Publish' button is shown with an arrow pointing to the Production environment. Below the card, the URL is: <https://884a021f0f.internal.studio.gamma.sequoia.aws.dev>.

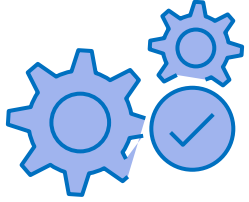
Each environment card also shows a 'Publish successful' status with a timestamp.

Separate Development, Testing, and Production deployment environments.

Streamlined publishing and sharing process ensures your applications are easily accessible to the intended users.

Access published applications using a unique URL, and share it with existing LDAP groups for easy access control.

# Customer use cases



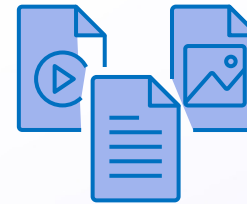
**Streamline claims processing**



**Digitize inspections and audits**



**Manage inventory and equipment**



**Consolidate metrics and reporting**



**Easily approve projects**

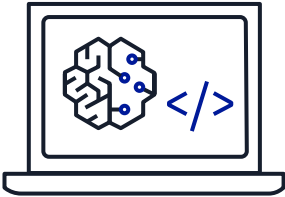


**Modernize operations by connecting systems**

# Amazon Bedrock Studio

# Bedrock Studio

BUILD GEN AI APPLICATIONS FASTER AND MORE SECURELY



Easy to use playground

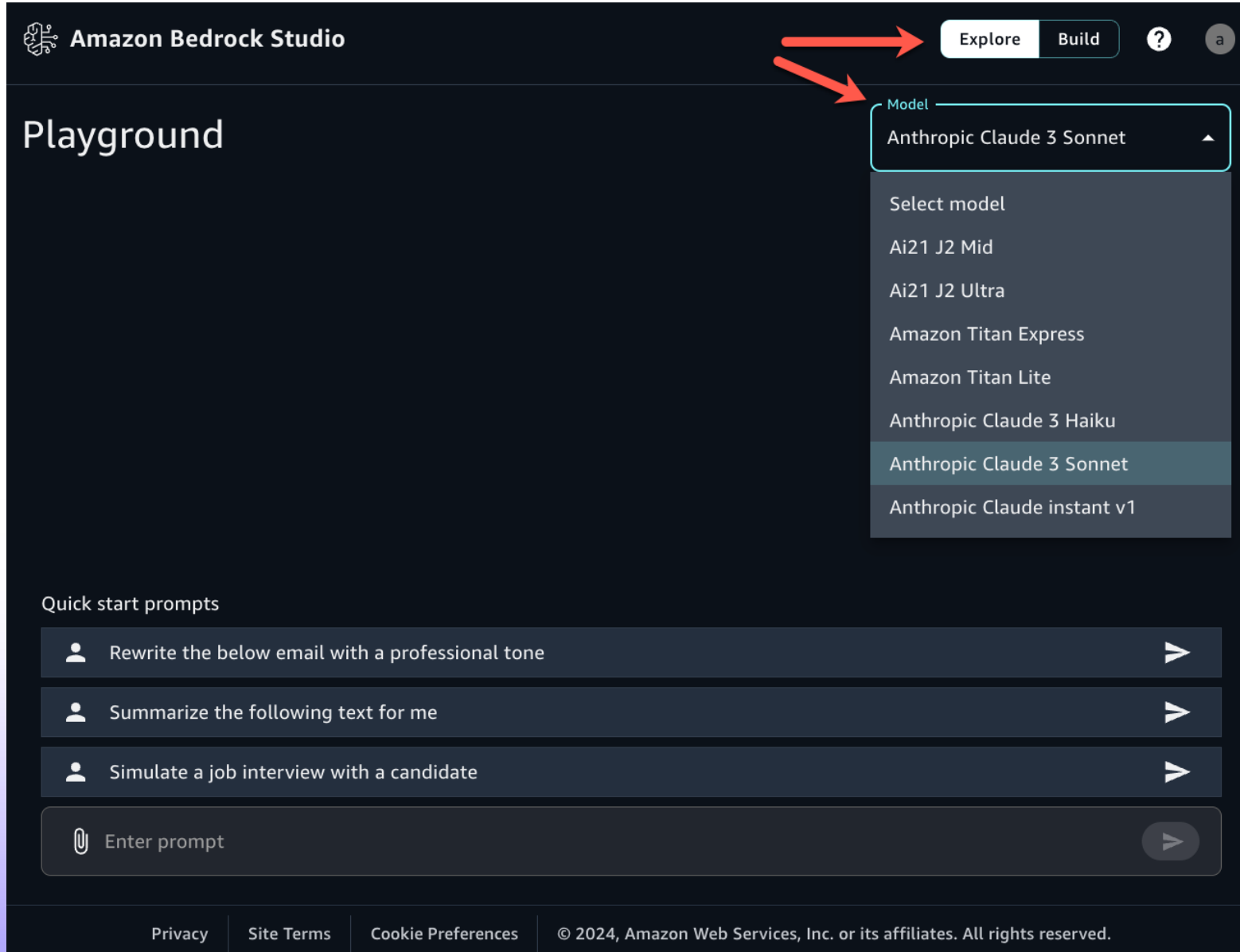


Projects based  
collaboration



Easy access with  
corporate SSO

# Start building Gen AI apps in a playground mode





# AI Use Case Explorer

Easily find the most relevant AI use cases with related content and guidance to make them real

[About AWS](#) [Contact Us](#) [Support](#) [English](#) [My Account](#) [Sign In](#) [Create an AWS Account](#)

[Products](#) [Solutions](#) [Pricing](#) [Documentation](#) [Learn](#) [Partner Network](#) [AWS Marketplace](#) [Customer Enablement](#) [Events](#) [Explore More](#) [Q](#)

[AI](#) [Overview](#) [Products](#) [Learn](#) [Customers](#) [Resources](#)

## AI Use Case Explorer

Explore the art of the possible in AI across industries and business functions

[Get started with generative AI](#) [Connect with a specialist](#)

### Top generative AI use cases




Improve customer experiences	+
Boost employee productivity	+
Accelerate process optimization	+

### Explore AI Use Cases

[Clear all filters](#)

▼ Use Case Category

☐ Customer experience ☐ Employee productivity ☐ Process optimization



aiexplorer.aws.amazon.com







# Thank you!

**Govind Palanisamy**

Solutions Architect

AWS

govpal@amazon.com

Please complete the survey for this session



**Artificial intelligence (AI) and machine learning (ML)**

Building AI and ML powered applications without machine learning expertise