INNOVATE

AI/ML EDITION

24 February 2022

AI/ML product development:

How to leverage AI services and create productive teams to deliver transformative experiences

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Principal Solutions Architect
AWS

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Agenda

1. Why AI/ML
2. Overview of the AWS Artificial Intelligence services
3. AI workloads: User experience, efficiency and decision support
4. Creating productive development teams, and building a roadmap

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Machine learning is transformative

Causing or able to cause an important and lasting change in someone or something

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AI and Machine Learning

AI's Promise

The allure and promise of Artificial Intelligence / Machine Learning is compelling

Barriers to Entry

Technology providers are democratising machine learning and lowering the initial technical and skills barriers to entry

Proof of Concepts

Machine Learning experiments and PoCs are getting easier, faster and cheaper to execute

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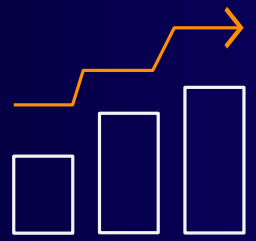
Why AWS for AI/ML?

BROADEST AND DEEPEST SET OF AI AND ML SERVICES

Track record of investment in services, features, and quality improvements, for everyone from ML scientists to application developers



ACCELERATE YOUR ADOPTION OF ML

Amazon SageMaker creates efficiencies and lowers costs

Acceleration programs and trainings

BUILT ON THE MOST COMPREHENSIVE CLOUD PLATFORM

The strongest set of compute, storage, security, database, and analytics capabilities to build upon

https://aws.amazon.com/what-is-aws/
https://aws.amazon.com/machine-learning/

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AI Services: Easily add intelligence to applications

No machine learning skills required

Vision

Chatbots

Business tools

Search

Healthcare

Speech

Text

Contact centers

Code and DevOps

Industrial

aws

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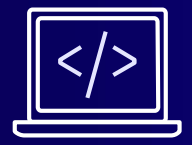
Amazon Transcribe

Automatically convert speech to text

Extract key business insights from customer calls, video files, clinical conversations, and more.

Improve business outcomes with state of the art speech recognition models that are fully managed and continuously trained.



Enhance accuracy with custom models that understand your domain specific vocabulary.

Ensure customer privacy and safety by masking sensitive information.

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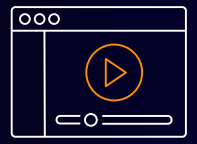
Amazon Transcribe

Pre-recorded media
Batch processing
(31 languages supported)



Audio file

Amazon Transcribe

Ingest audio

Apply selected features

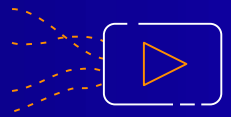
Process audio

Transcription file

Live streaming content
Real-time transcriptions
HTTP2 or WebSocket
(11 languages supported)

Audio stream

Text stream



Fully-managed by Amazon Transcribe

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Amazon Comprehend

A fully managed and continuously trained service that discovers insights and relationships in text.

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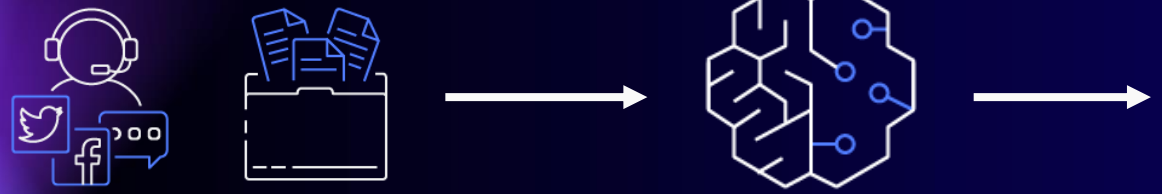
Amazon Comprehend



Documents

Email, chat, social, phone calls and more

Amazon Comprehend

Automatically extract insights from text

- Entities + Custom Entities
- Key Phrases
- PII *(Personally Identifiable Information)*
- Sentiment
- Document Classification
- Topics
- Language
- Syntax
- Events

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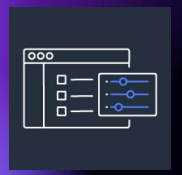
Amazon Comprehend use cases

Intelligent document processing



Automation of email workflows

Customer support tickets routing

Documents and media tagging

Customer sentiment analysis

Contact center call analysis

Personally Identifiable Information (PII) detection and redaction

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Amazon Polly

Natural sounding Text-To-Speech

Support for Speech Synthesis Markup Language (SSML)

Lexicons

Speech Marks

Brand Voice

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> “We are looking to Amazon Connect to help us improve the experience customers have when they contact our call centers. For that reason, it was also important that the voice we created using Amazon Polly Brand Voice felt both uniquely NAB and consistent with our position and what our customers expect when they call us. We’re thrilled to be a global leader using this voice-first digital innovation.”

Laurent De Segur

General Manager of Digital and Assisted Channels - **National Australia Bank**

https://aws.amazon.com/blogs/machine-learning/build-a-unique-brand-voice-with-amazon-polly/

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> “I can't think of many use cases where accurate pronunciation is more important than when you're learning a new language. We have found that the Amazon Polly voices are not just high in quality, but are as good as natural human speech for teaching a language.”

Severin Hacker

CTO - **Duolingo**

https://aws.amazon.com/blogs/machine-learning/powering-language-learning-on-duolingo-with-amazon-polly/

https://aws.amazon.com/machine-learning/customers/innovators/duolingo/

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Language services

Amazon Transcribe

Amazon Comprehend

Amazon Polly

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Amazon Rekognition

OBJECT, SCENE, AND ACTIVITY

CUSTOM LABELS

CONTENT MODERATION

TEXT

PPE DETECTION

FACE DETECTION AND ANALYSIS

FACE COMPARE & SEARCH

CELEBRITY RECOGNITION

VIDEO SEGMENTS

LIVE STREAM VIDEO

PATHING

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Amazon Rekognition

WORKPLACE SAFETY

PPE detection

Vehicle or person detection

Person of interest

IDENTITY VERIFICATION

Test taker fraud detection

Know your customer (KYC)

Service access verification

MEDIA ANALYSIS

Search & discovery tagging

Content operations

Inappropriate content

INDUSTRIAL & RETAIL

Parts classification

Inventory management

Damage detection

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> “From a lag time of half a day, we are now able to curate images in seconds. Moreover, Amazon Rekognition has kept improving, leading to better overall quality of automatic curation over time.”

Sumesh Menon

CEO & Co-Founder - **Woo**

https://aws.amazon.com/rekognition/customers/

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Content moderation

Top-level category	Second-level category
Explicit Nudity	Nudity Graphic Male Nudity Graphic Female Nudity Sexual Activity Illustrated Nudity Adult Toys
Suggestive	Female Swimwear Or Underwear Male Swimwear Or Underwear Partial Nudity Revealing Clothes
Violence	Graphic Violence Or Gore Physical Violence Weapon Violence Weapons Self Injury
Visually Disturbing	Emaciated Bodies Corpses Hanging

Top-level category	Second-level category
Rude Gestures	Middle Finger
Drugs	Drug Products Drug Use Pills Drug Paraphernalia
Tobacco	Tobacco Products Smoking
Alcohol	Alcoholic Beverages Drinking
Gambling	Gambling
Hate Symbols	Nazi Party White Supremacy Extremist

Amazon Rekognition does not flag content as “safe” or “unsafe”

Instead, you get granular output about the nature of the content. You can apply your own policies that define what is safe for your customers.

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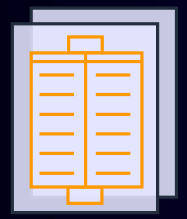
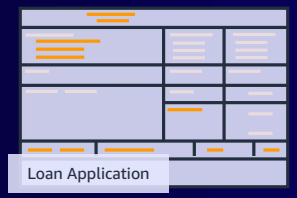
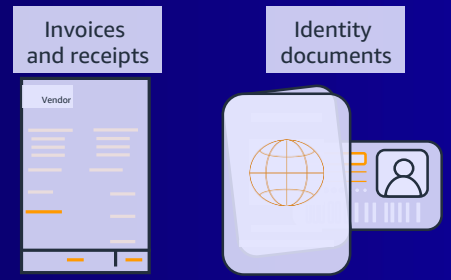
Amazon Textract



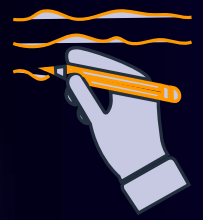
Text



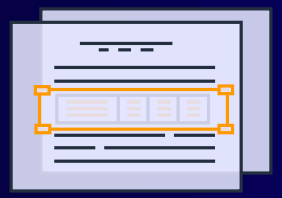
Forms



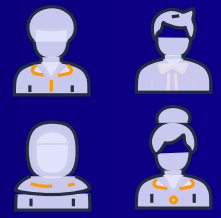
Specialized documents



Handwriting



Tables



Human-in-the-loop (Amazon A2I)

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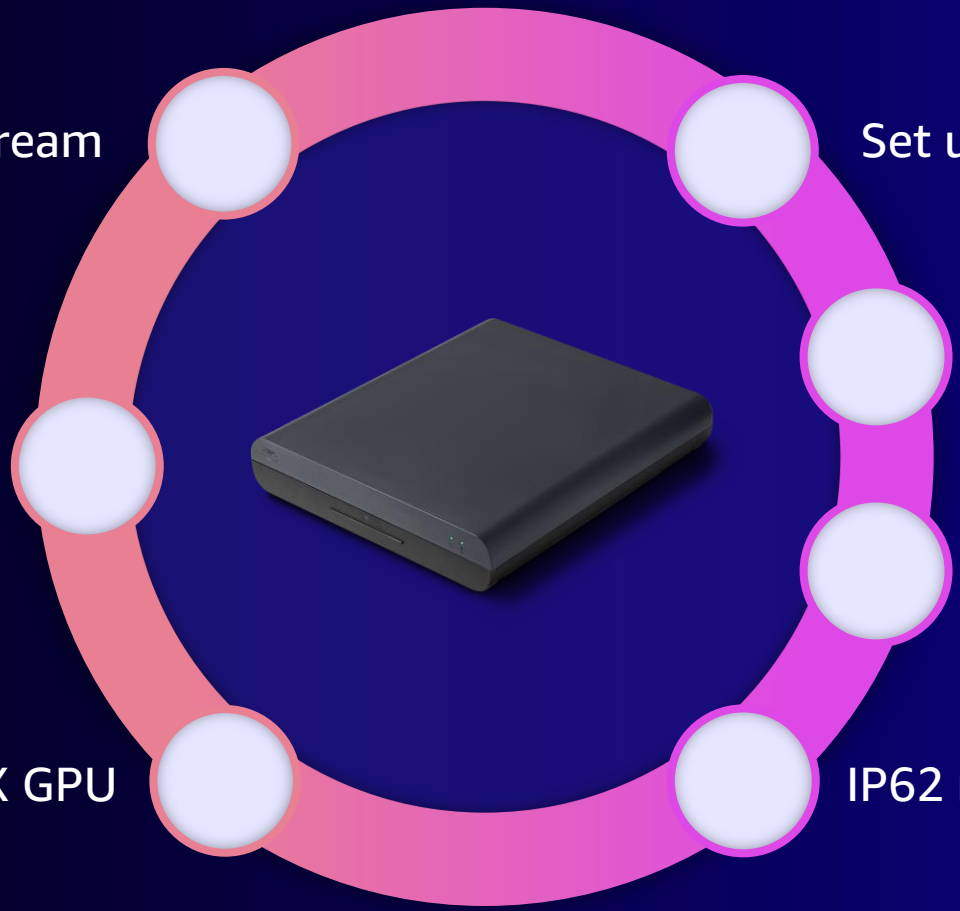
AWS Panorama

Powerful CV SDK & appliance for industrial environments

Multiple models per stream

Set up in minutes



Connects to IP cameras

Multiple camera streams in parallel

Runs custom models or production-ready CV apps at the edge

NVIDIA Xavier AGX GPU

IP62 ruggedized device

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AWS AI/ML across industries

HEALTHCARE AND LIFE SCIENCES

Reduce costs, improve patient outcomes, and enable the discovery and manufacturing of new drugs

MEDIA AND ENTERTAINMENT

Accelerate content creation and curation, increase customer engagement, and improve monetization

FINANCE

Detect fraud, process documents faster, personalize recommendations, and perform credit decisioning

RETAIL

Personalize product recommendations, forecast demand, and predict fraud

INDUSTRIAL AND MANUFACTURING

Implement predictive maintenance, improve workplace safety, automate visual inspection, and optimize supply chains

https://aws.amazon.com/machine-learning/

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AI workloads

Experience	User facing AI
Efficiency	Operator facing AI
Decision Support	Manager facing AI

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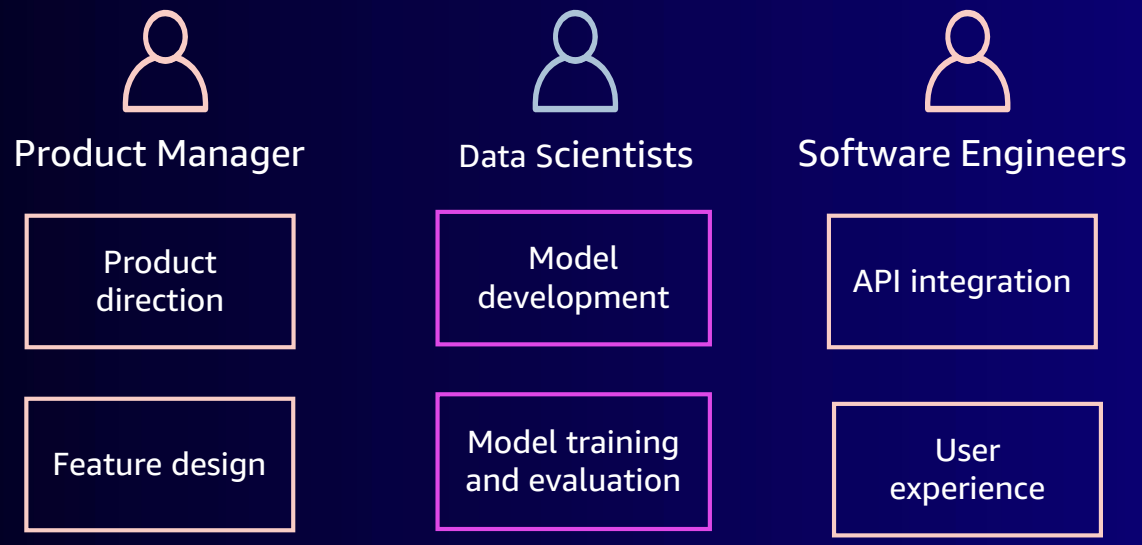
Building AI feature teams



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Team structure

Efficient feature teams

1 Product Manager

3 – 6 Software Engineers

2 – 3 Data Scientists

Ability to execute independently

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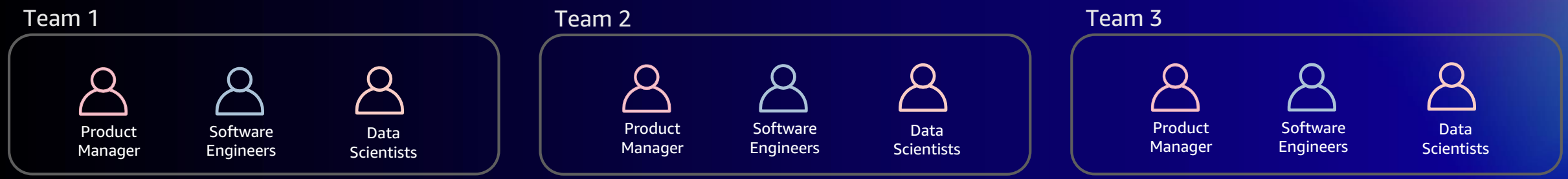
Scale

Multiple teams supported by a Machine Learning Center of Excellence (COE)



Machine Learning Center of Excellence
with representation from your project teams

- Vision and strategy
- MLOps tooling and processes
- Project validation
- Project management
- Data oversight
- Algorithm selection
- Cost enforcement
- AWS account administration
- AWS governance and compliance
- Environment configurations
- Security standards
- Continual knowledge sharing
- Celebrate successes
- Learn from failures

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Roadmap & goals

Setting the team's direction

Align goals between PM and engineers

Document shared success criteria

Measure

Iterate

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The AWS AI/ML stack

AI SERVICES

Vision
Rekognition

Chatbots
Lex

Business tools
Personalize
Forecast
Fraud Detector
Lookout for Metrics

Search
Kendra

Healthcare
HealthLake
Comprehend Medical
Transcribe Medical

Speech
Polly
Transcribe

Text
Comprehend
Translate
Textract

Contact centers
Contact Lens
Connect Voice ID

Code + DevOps
CodeGuru
DevOps Guru

Industrial
Panorama Appliance and SDK, Monitron, Lookout for Equipment, Lookout for Vision

AMAZON SAGEMAKER

Label data

SAGEMAKER STUDIO IDE

Data collection prep | Store features | Detect bias and explain predictions | Visualize in notebooks | Pick algorithm | Train models faster | Tune parameters | Deploy in production | Manage and monitor

CI/CD

Manage edge devices

ML FRAMEWORKS AND INFRASTRUCTURE

TensorFlow, PyTorch, Apache MXNet | Deep learning AMIs and containers | GPUs | Inferentia | Elastic inference | FPGA

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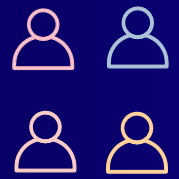
AWS resources to help

AI POC In A Box

AI Service Immersion Days

ML Solutions Lab

AWS Partner Network for AI / ML



...And more

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Visit the AI & Machine Learning resource hub for more resources

Dive deeper into these resources, get inspired and learn how you can use AI and machine learning to accelerate your business outcomes.

- The machine learning journey e-book
- 7 leading machine learning use cases e-book
- A strategic playbook for data, analytics, and machine learning e-book
  Accelerate machine learning innovation with the right cloud services & infrastructure e-book
- Choosing the right compute infrastructure for machine learning e-book
- Improving service and reducing costs in contact centers e-book
- Why ML is essential in your fight against online fraud e-book
- … and more!

https://bit.ly/3mwi59V

Visit resource hub

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AWS Machine Learning (ML) Training and Certification

AWS is how you build machine learning skills

Courses built on the curriculum leveraged by Amazon's own teams. Learn from the experts at AWS.

aws.training/machinelearning

Flexibility to learn your way

Learn online with on-demand digital courses or live with virtual instructor-led training, plus hands-on labs and opportunities for practical application.

explore.skillbuilder.aws/learn

Validate your expertise

Demonstrate expertise in building, training, tuning, and deploying machine learning models with an industry-recognized credential.

aws.amazon.com/certification

aws

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Thank you for attending AWS Innovate – AI/ML Edition

We hope you found it interesting! A kind reminder to **complete the survey.**
Let us know what you thought of today's event and how we can improve the event experience for you in the future.

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Thank you!

Jonathan Hedley

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