



INNOVATE

DATA AND AI/ML EDITION

22 February 2023

Transform your business with AI/ML:

Create a competitive advantage in your organization by leveraging AI/ML latest trends

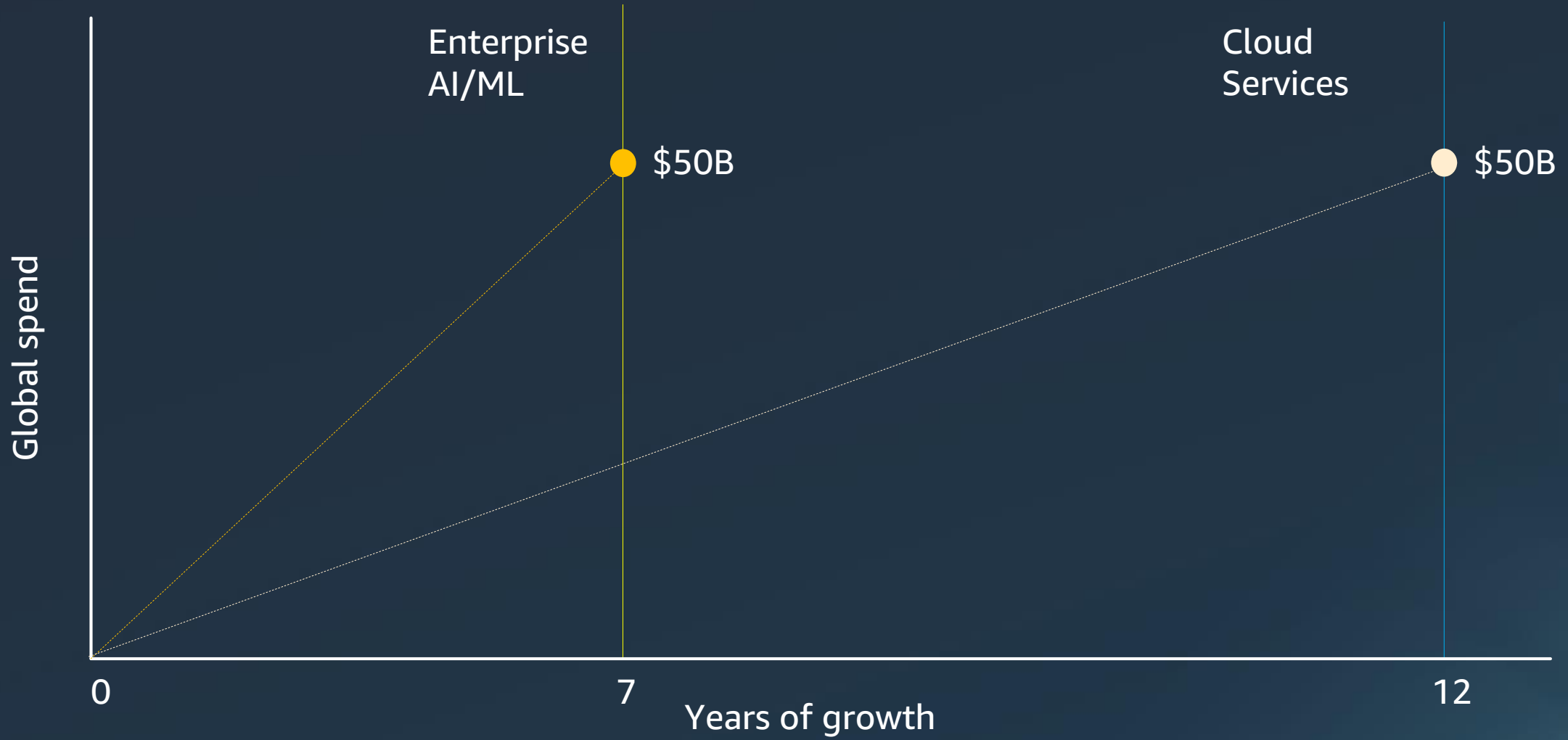
Nieves Garcia

AI/ML Specialist Lead, Public Sector, APJ
Amazon Web Services

Agenda

1. Why AI/ML? Creating a competitive advantage
2. AI/ML state of the art and 6 key trends
3. Getting started

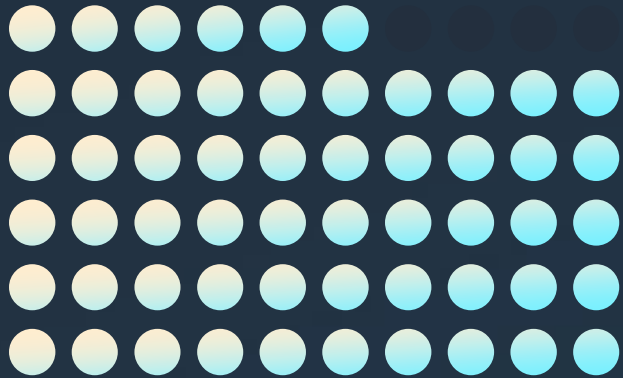
Machine learning is key to innovation



Source: IDC Worldwide Semiannual Artificial Intelligence Spending guide, Publication August 2021; IDC Semiannual Public Cloud Services Tracker, 1H2021, November 11, 2021
Note: Enterprise AI/ML and Cloud Services (Infrastructure and platform services) categories are not mutually exclusive

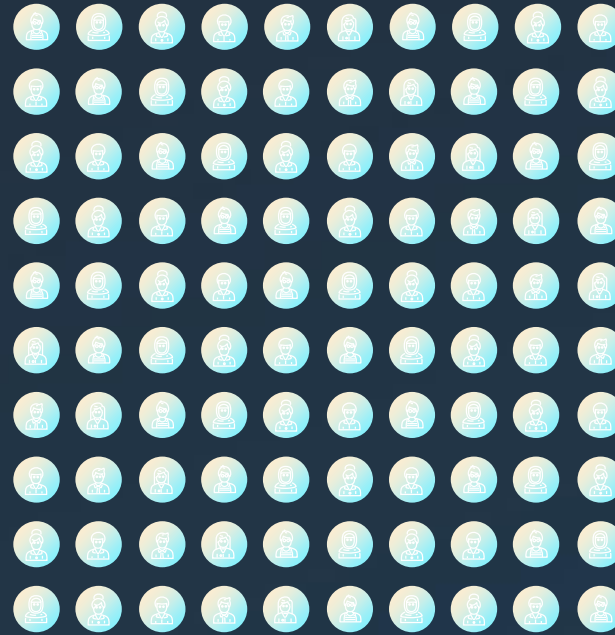
Machine learning is mainstream today

ML has
become mainstream



56%
of all respondents
report AI adoption in
at least one function¹

More customers do ML on
AWS than anywhere else



100,000+
customers use
AWS AI/ML services

¹Source: McKinsey Global Survey on AI, December 2021

AI Hierarchy of Needs

INTUIT facebook amazon

Business Value

Human effort focused on **value** creation for all external & internal customers

Customer-obsessed
value

Actionable insight

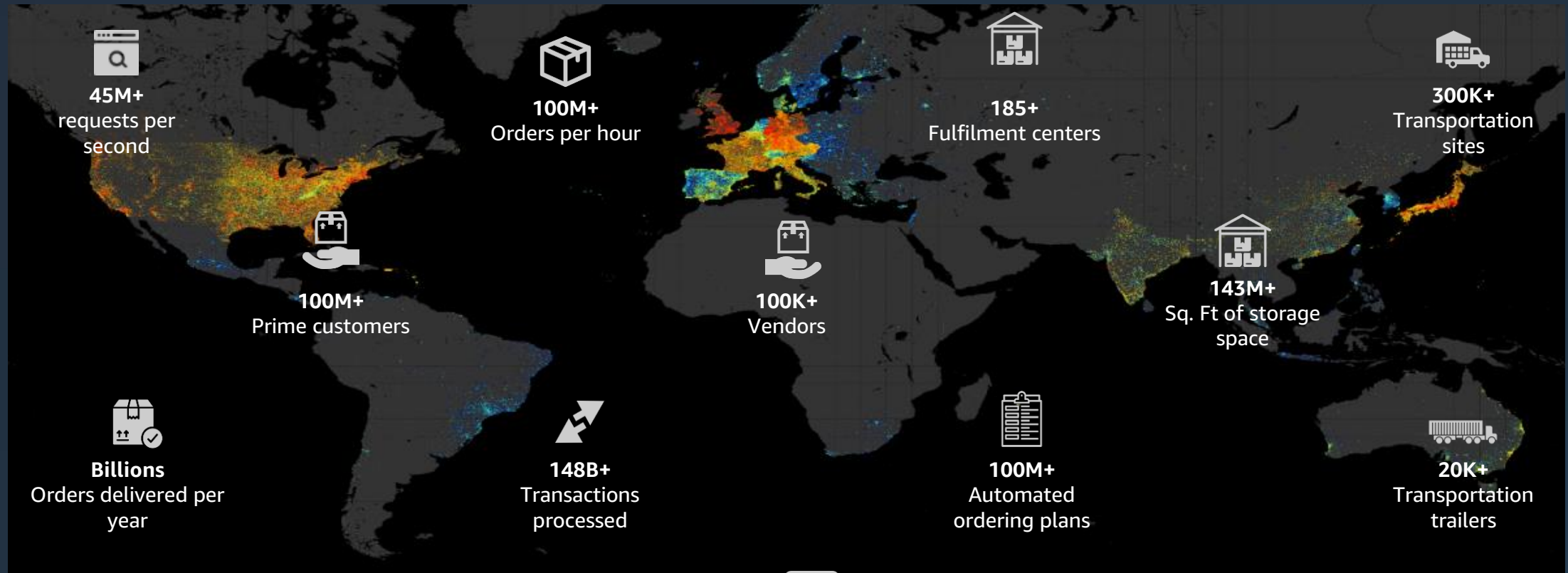
Data

AI Automation

MLOps
ML Infra
Data Infra

<https://www.amazon.science/>
<https://aws.amazon.com/events/summits/machine-learning>
<https://www.intuit.com/blog/tag/machine-learning/>
<https://ai.facebook.com/>

End-to-end automation at scale



Automated Forecasting
Multi-year and weekly for
100M+ products



Capacity Optimization
Regional and local
demand distributions by
segment



Automated Buying
99% inventory purchasing
automation

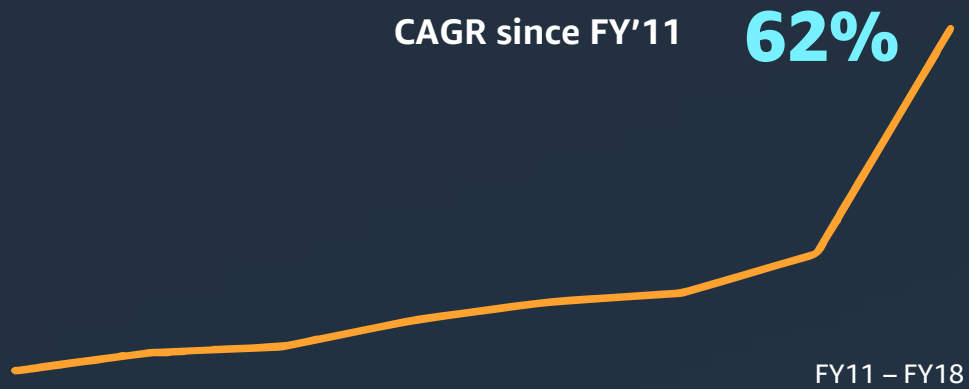


Automated Placement
Prediction and routing of
inventory between
fulfilment centers

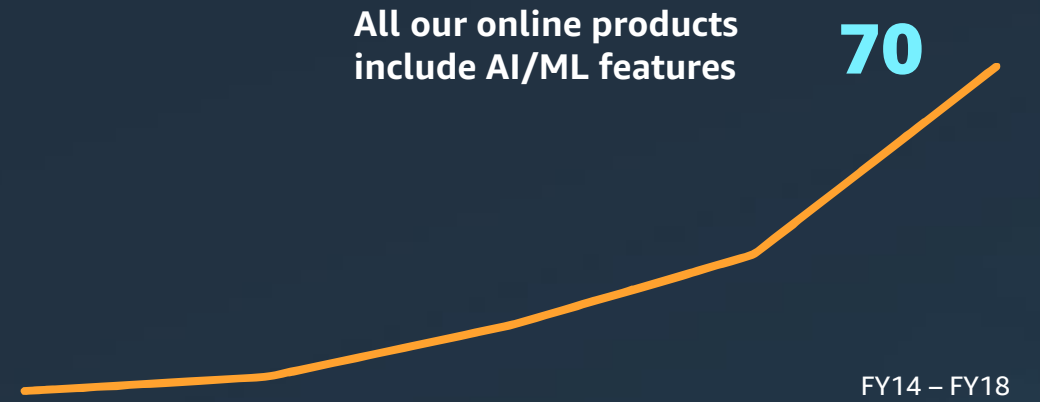


Automated Fulfillment
Real-time optimization
among hundreds of
shipping options

AI/ML data science hiring continues to accelerate



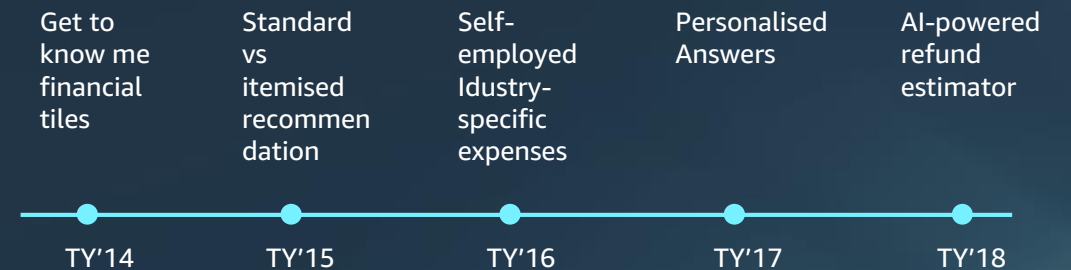
70 machine learning models in production



349 AI/ML/data science patents filed

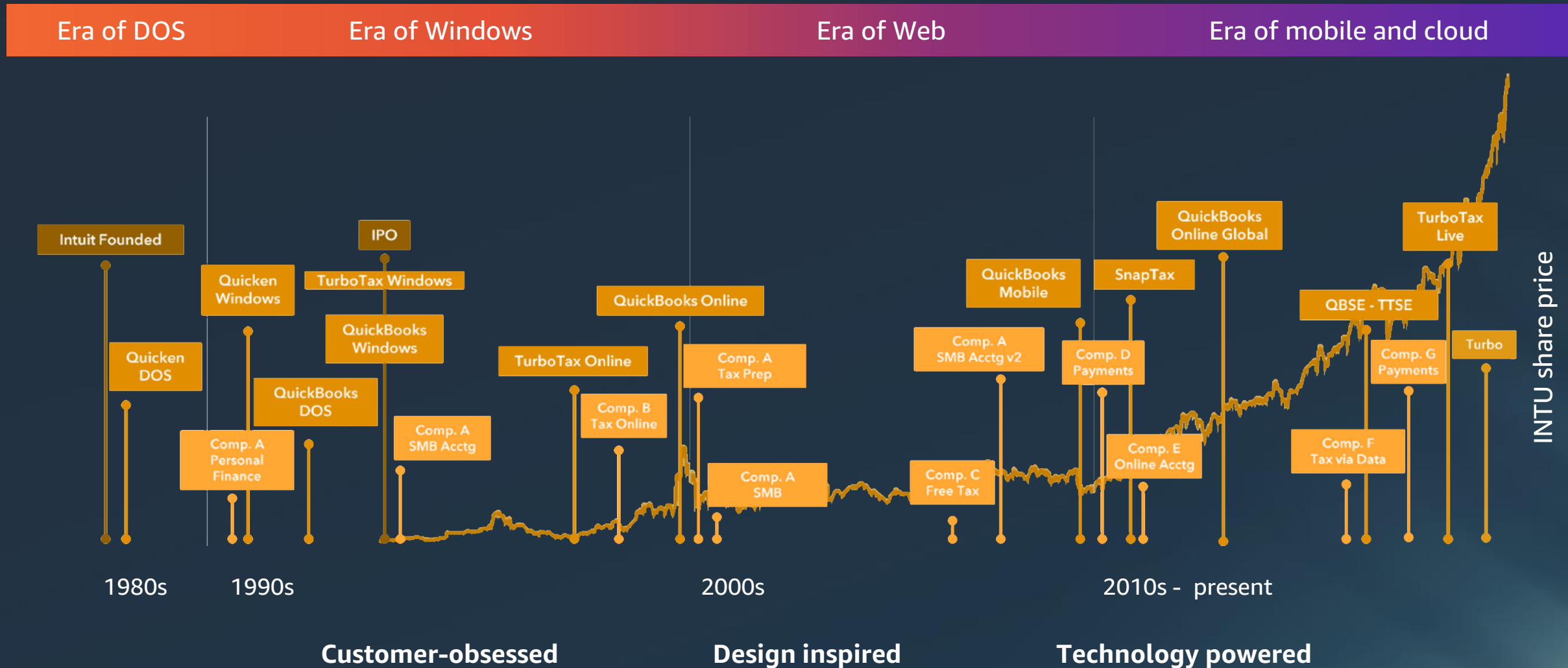


TurboTax is getting smarter through AI/ML

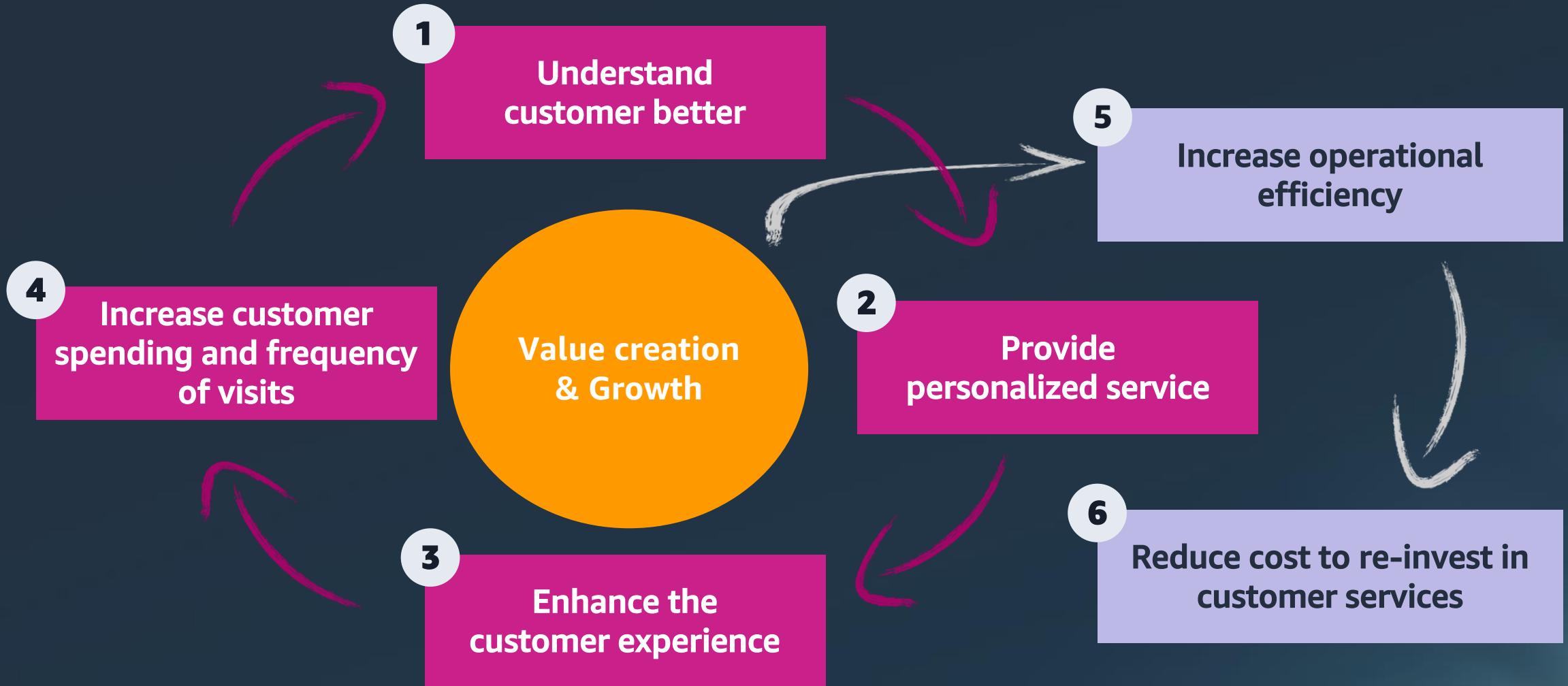


[Intuit Investor Day - Sept, 2018] https://s21.q4cdn.com/374309911/files/doc_presentations/2018/FINAL_WebPostDeck_Intuit_InvestorDay2018v2.pdf

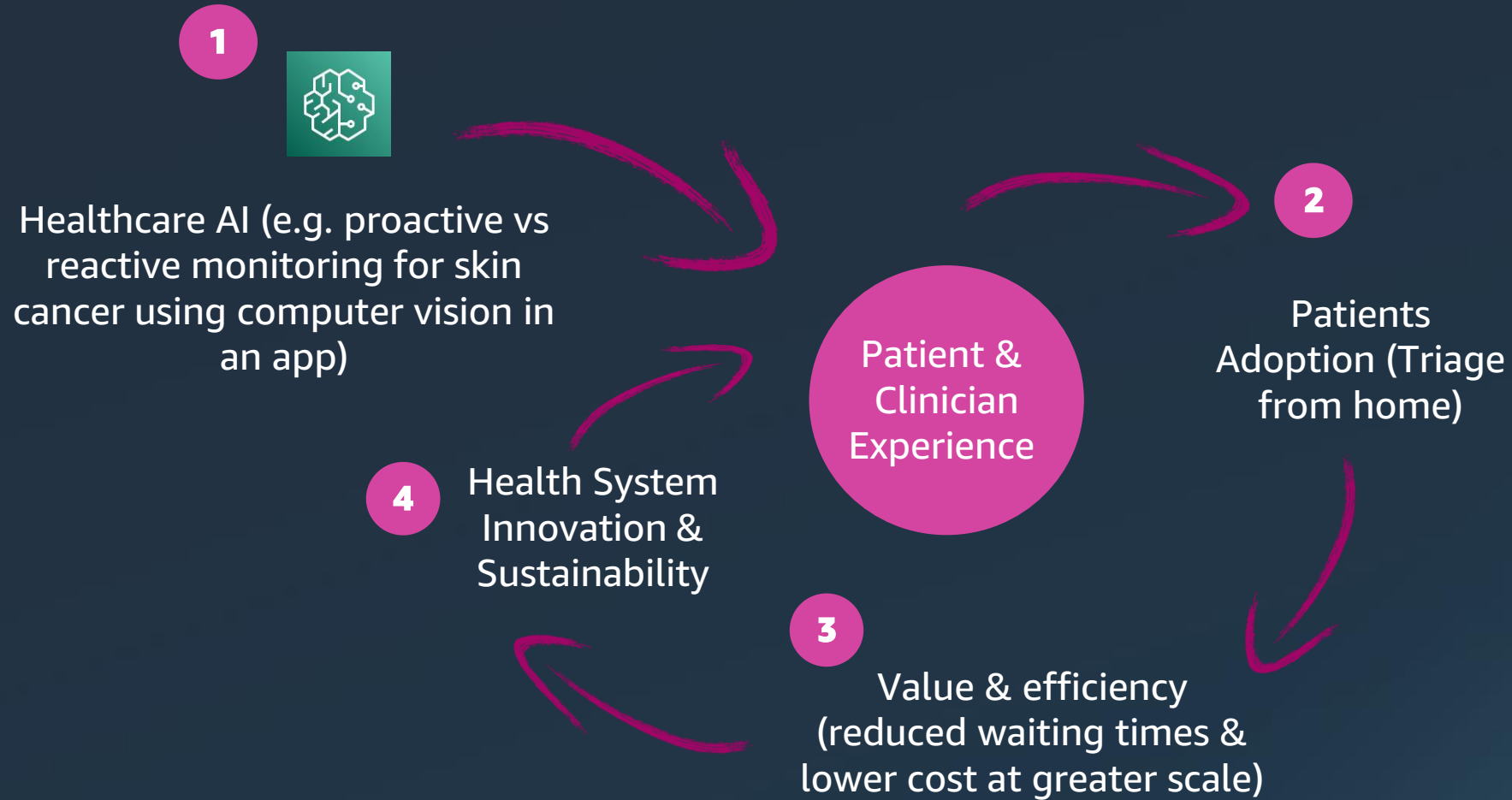
History of self-disruption & reimagination



To propel innovation, build a Value Creation Flywheel powered by AI



AI Flywheel for Healthcare



**Our mission at AWS is
democratize AI/ML ...**



**Making machine learning accessible to all
customers (developers, data scientists and
business users)**

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

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



ACCELERATE YOUR ADOPTION OF ML

Amazon SageMaker creates efficiencies and lowers costs
Acceleration programs and trainings

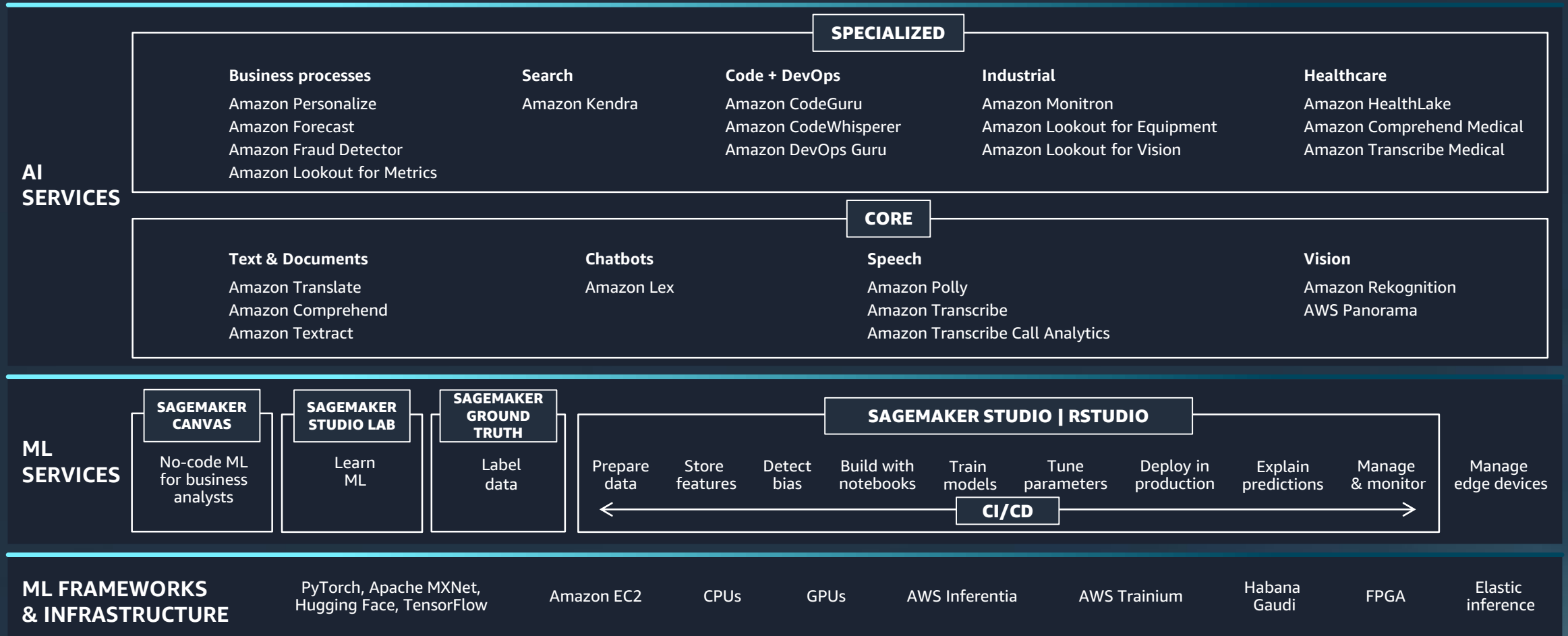


BUILT ON THE MOST COMPREHENSIVE CLOUD PLATFORM

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

The AWS ML stack

Broadest and most complete set of machine learning capabilities



Six key trends driving ML innovation



**Model
sophistication**



**Data
growth**



**ML
industrialization**



**ML-powered
use cases**

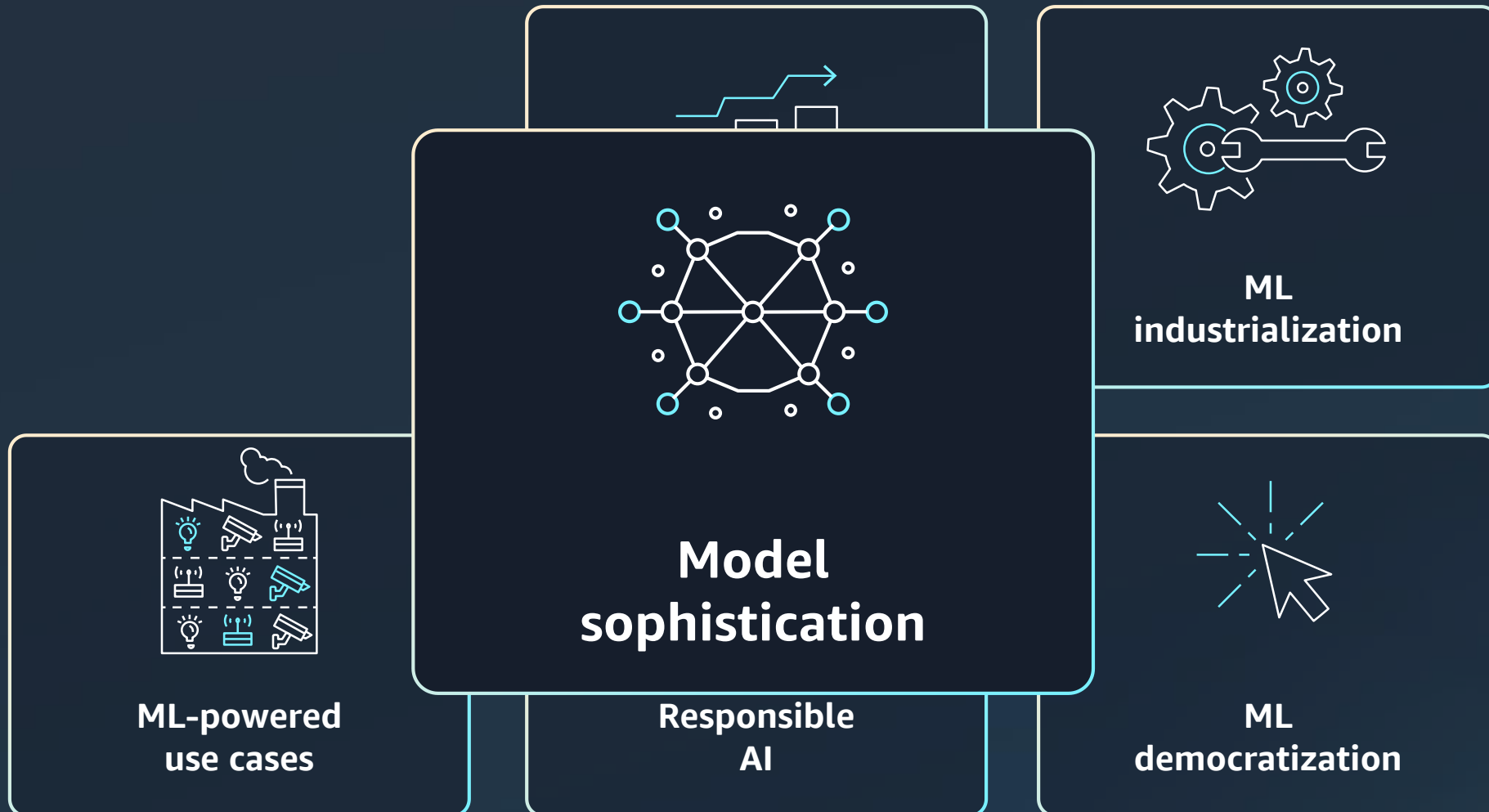


**Responsible
AI**

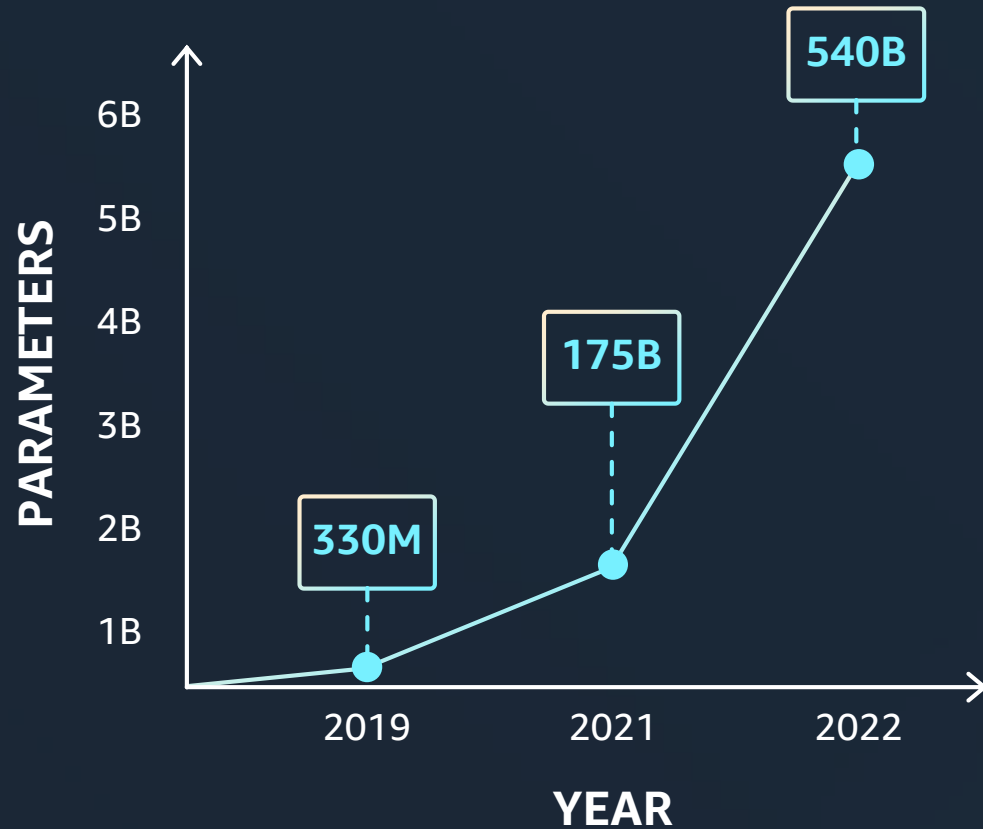


**ML
democratization**

Six key trends driving ML innovation



Model sophistication - Rise of foundation models



2019–2022

1,600x

**increase in size of model
as measured by number
of parameters**



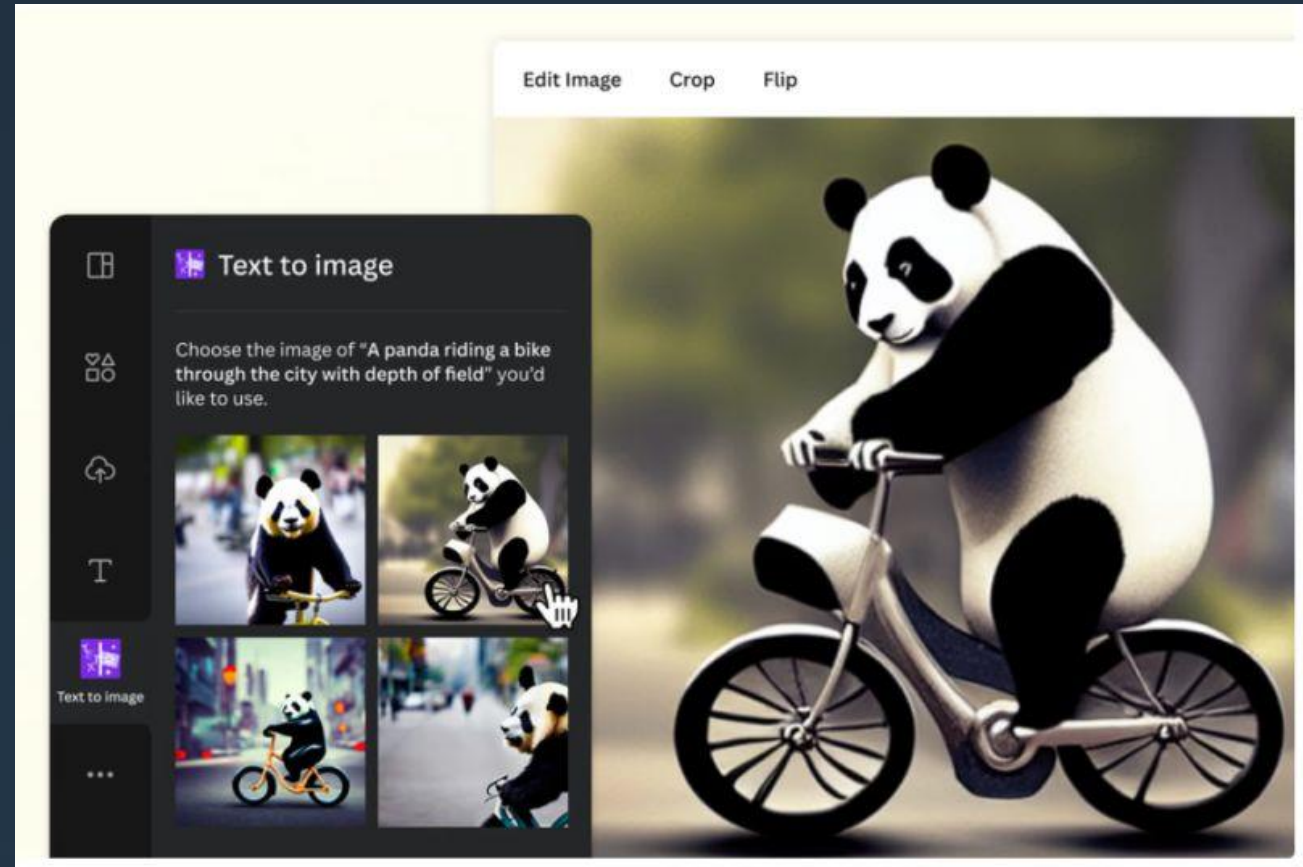
Canva Scales Text to Image to 100 Million Users Quickly Using Amazon SageMaker & Amazon Rekognition



Under 3 weeks
to ship text-to-image feature to users

Improved productivity
by adding content moderation

Accelerated innovation
in ML for users



<https://aws.amazon.com/solutions/case-studies/canva-sagemaker-case-study/>

Six key trends driving ML innovation



Core AI services to extract insights from your data



Amazon Textract

Automatically extract printed text, handwriting, and data from any document



Amazon Comprehend

Automatically extract insights from text



Amazon Transcribe

Automatic speech to text with analytics



Amazon Rekognition

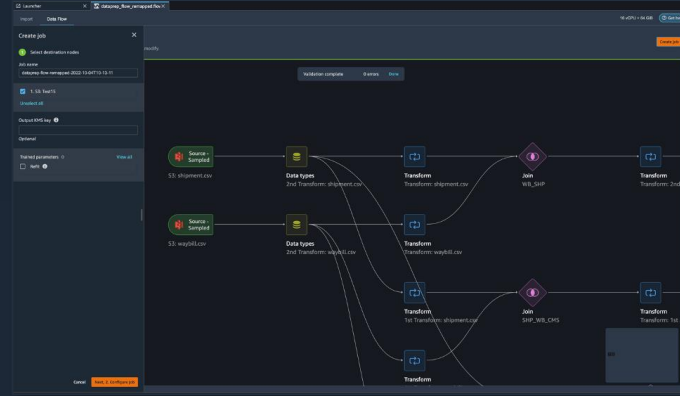
Automate your image and video analysis

Amazon SageMaker data preparation capabilities



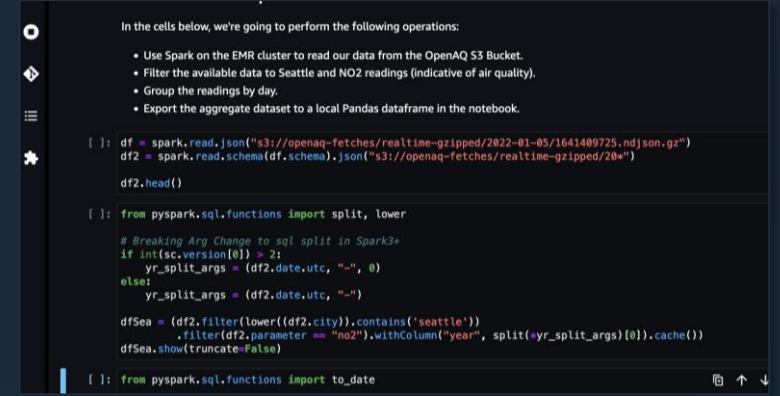
Amazon SageMaker Ground Truth

Data labeling for images, video, audio, and more



Amazon SageMaker Data Wrangler

Low-code data preparation for tabular data



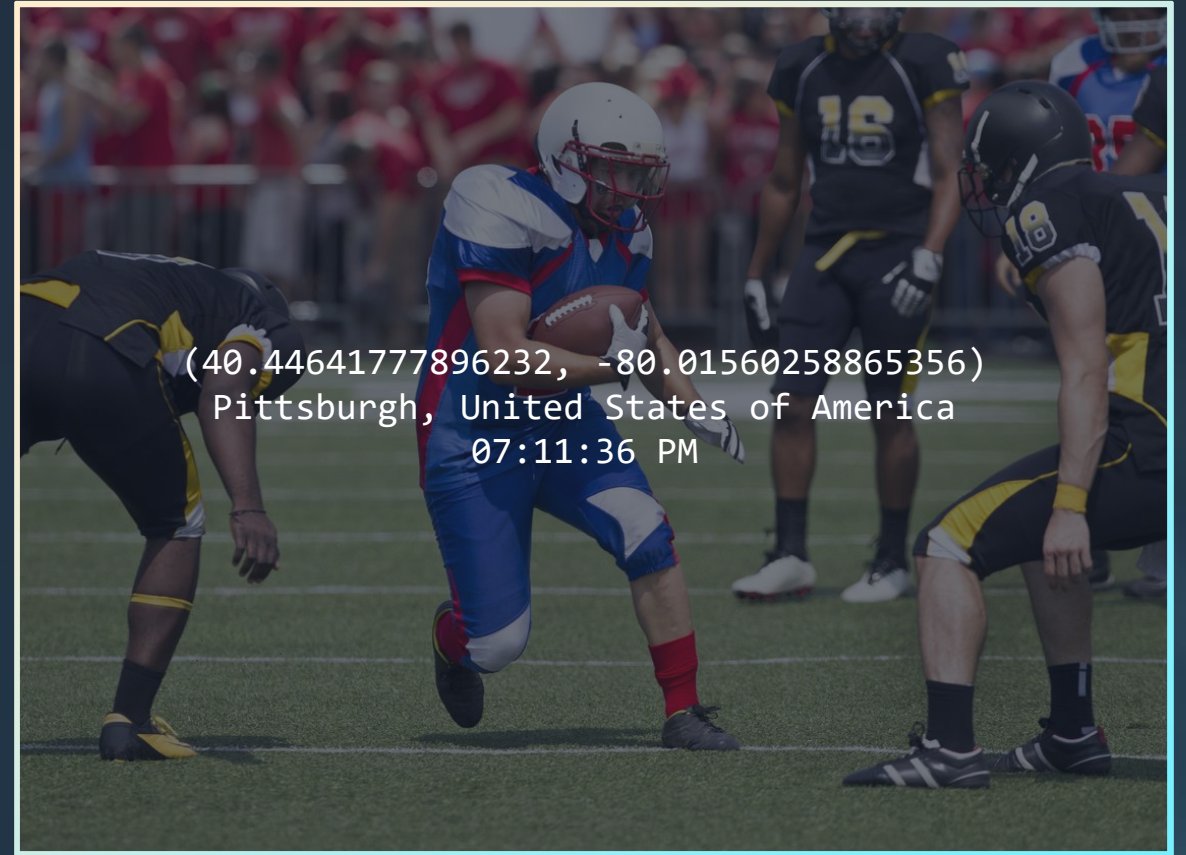
Amazon SageMaker Studio notebooks

Data processing in notebooks using Spark on Amazon EMR

ML with Amazon SageMaker



What?, who?

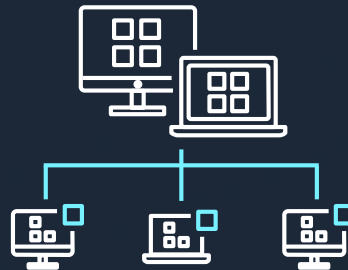


When?, where?

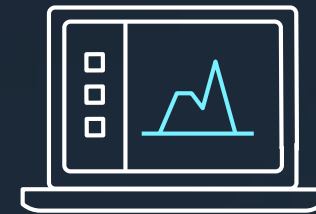
Geospatial ML with Amazon SageMaker



Single API
access to
disparate data



Built-in
algorithms to
enrich data



Visualizing tools
tailored for
geospatial data

Sustainable mobility for urban cities



Predict the **impact of new traffic regulations** on urban ecosystems and BMW customers



Help **identifying optimal locations** for new charging stations



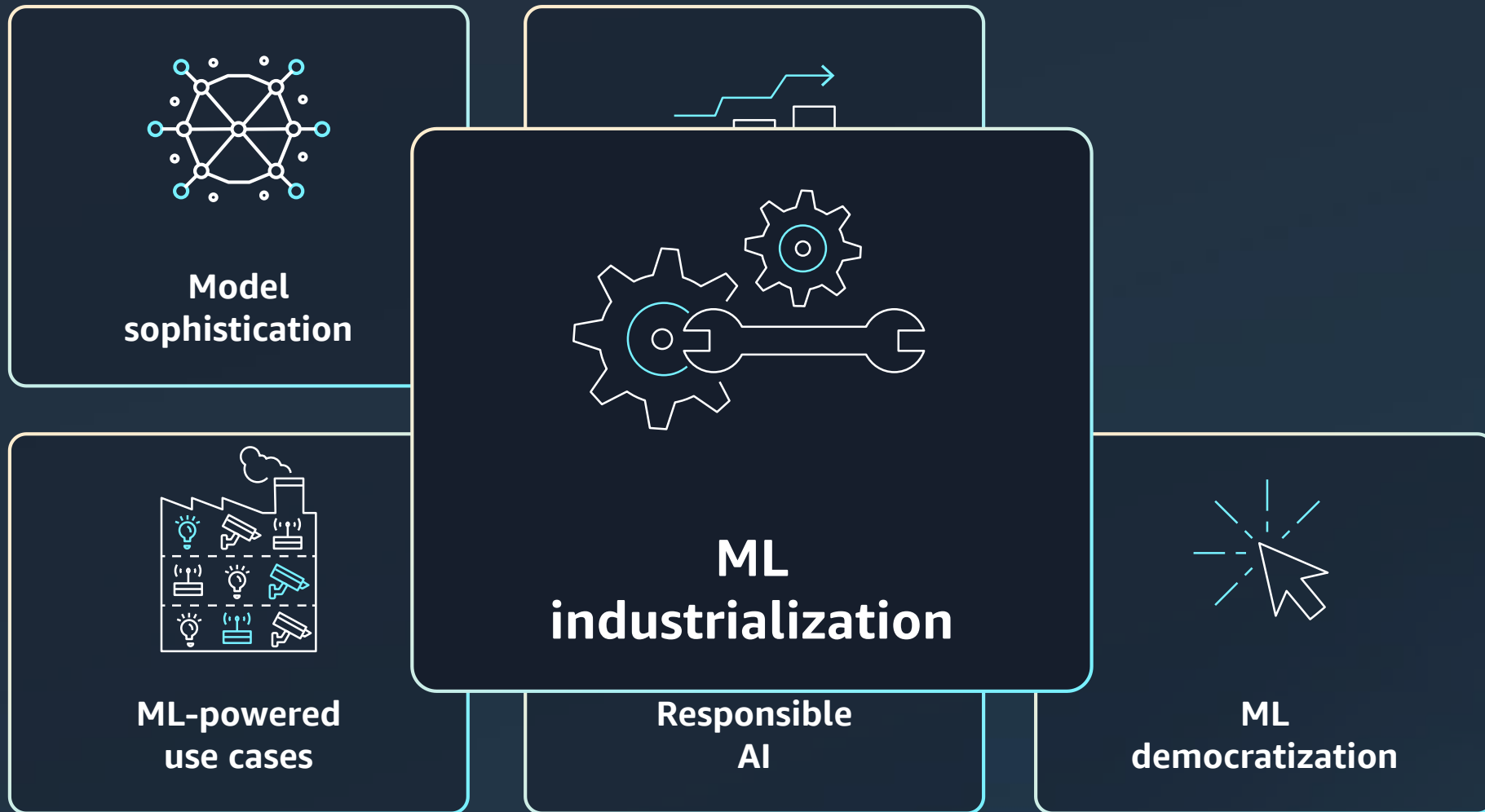
Predict **impact of parking prices** on mobility and emissions

<https://aws.amazon.com/solutions/case-studies/bmw-group-case-study/>



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Six key trends driving ML innovation

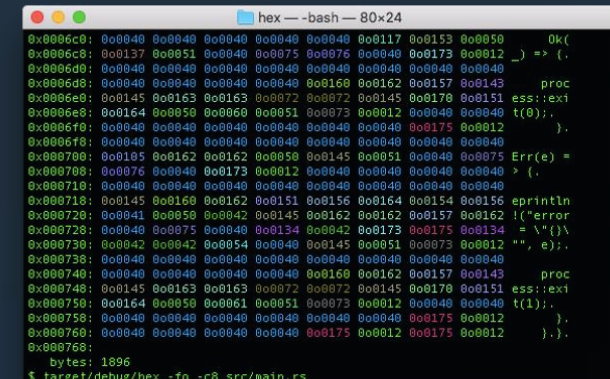


Industrialized software -> Industrialized ML



Source Code

IDE
Debugger
Profiler
Workspace
CI/CD
...

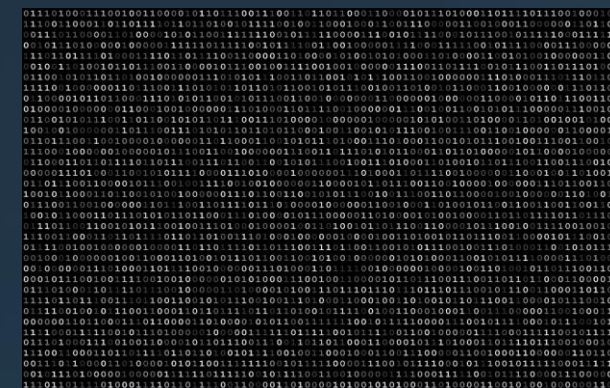


Executable Code

01010100101001
01010101010010
01010101001001
01101010010010
10010101001011

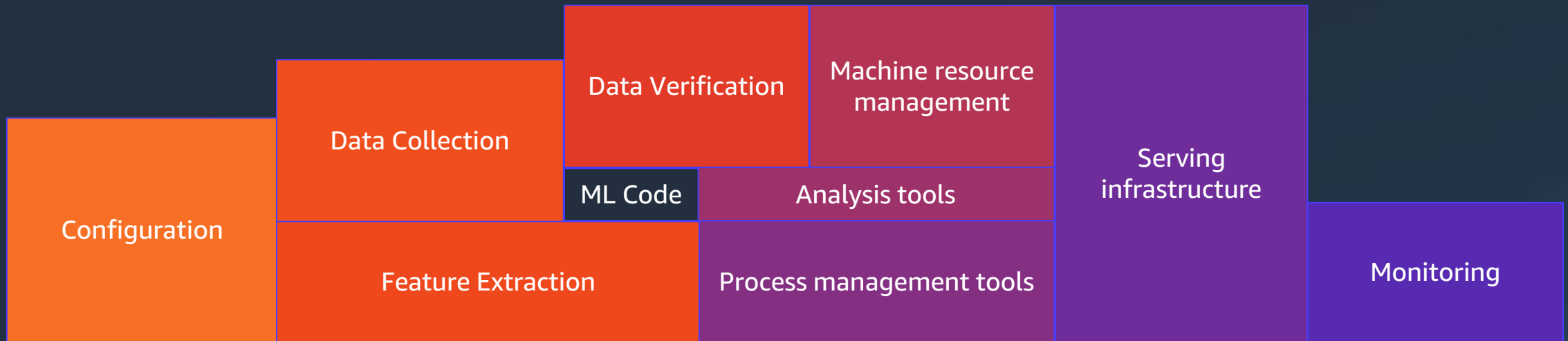
Data

Studio
Debugger
Profiler
Experiments
Manager
Pipelines
...



Model

Remove the heavy lifting, focus on the outcome



Most customers want to focus on the value (SME expertise passed to an ML model)

Undifferentiated heavy lifting

Amazon SageMaker feature tour

Prepare data and build, train, and deploy ML model for any use case

PREPARE

Geospatial

Visualize geospatial data

Ground Truth

Create high quality datasets for ML

Data Wrangler

Aggregate and prepare data for ML

Processing

Built-in Python, BYO R/Spark

Feature Store

, catalog, search, and reuse features

Clarify

Detect bias and understand model predictions

BUILD

Studio Notebooks & Notebook Instances

Fully managed Jupyter notebooks with elastic compute

Studio Lab

Free ML development environment

Built-in Algorithms

Integrated tabular, NLP, and vision algorithms

JumpStart

UI based discovery, training, and deployment of models, solutions, and examples

Autopilot

Automatically create ML models with full visibility

Bring Your Own

Bring your own container and algorithms

Local Mode

Test and prototype on your local machine

TRAIN & TUNE

Fully Managed Training

Broad hardware options, easy to setup and scale

Distributed Training Libraries

High performance training for large datasets and models

Training Compiler

Faster deep learning model training

Automatic Model Tuning

Hyperparameter optimization

Managed Spot Training

Reduce training cost by up to 90%

Debugger and Profiler

Debug and profile training runs

Experiments

Track, visualize, and share model artifacts across teams

Customization Support

Integrate with popular open source frameworks and libraries

DEPLOY & MANAGE

Fully Managed Deployment

Ultra low latency, high throughput inference

Real-Time Inference

For steady traffic patterns

Serverless Inference

For intermittent traffic patterns

Asynchronous Inference

For large payloads or long processing times

Batch Transform

For offline inference on batches of large datasets

Multi-Model Endpoints

Reduce cost by hosting multiple models per instance

Multi-Container Endpoints

Reduce cost by hosting multiple containers per instance

Shadow Testing

Validate model performance in production

Inference Recommender

Automatically select compute instance and configuration

Model Monitor

Maintain accuracy of deployed models

Kubernetes Operators & Components

Manage and monitor models on edge devices

Edge Manager

Manage and monitor models on edge devices

MLOps: Pipelines | Projects | Model Registry

Workflow automation, CI/CD for ML,
central model catalog

Canvas

Generate accurate machine learning
predictions—no code required

Studio | RStudio

Integrated development
environment (IDE) for ML

Governance

Model Cards | Dashboard |
Permissions

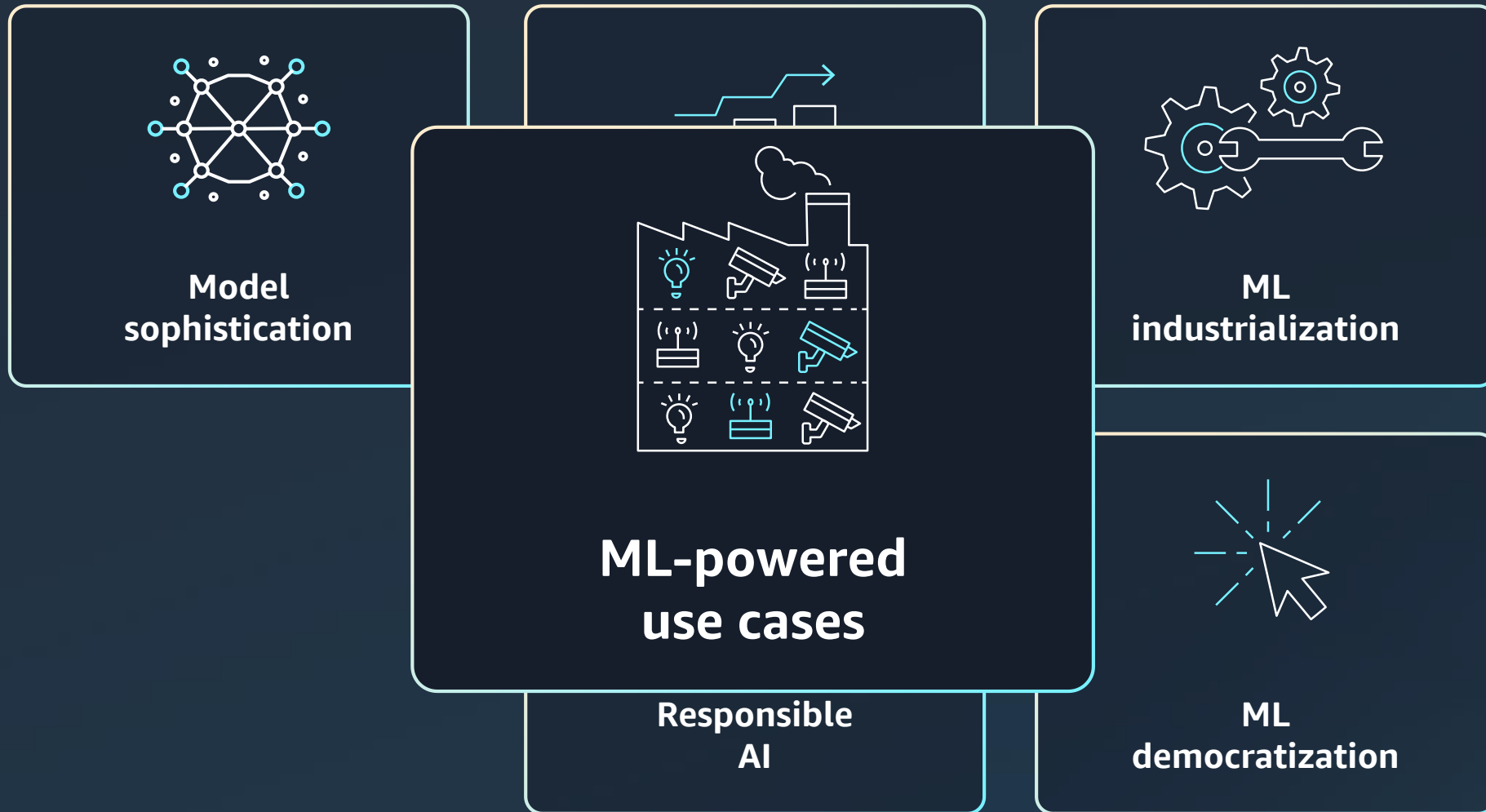
<https://aws.amazon.com/sagemaker/>



Tens of thousands of customers industrializing ML with Amazon SageMaker



Six key trends driving ML innovation

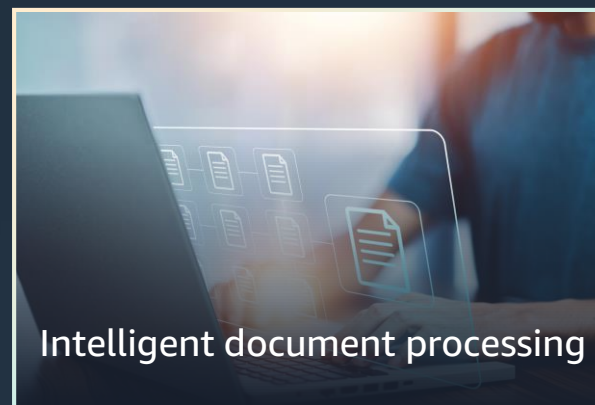




Contact center intelligence



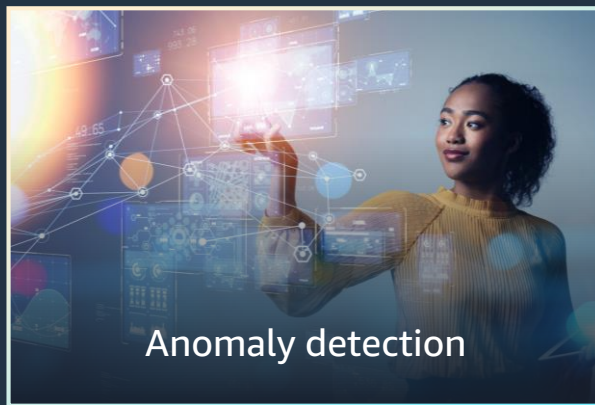
Forecasting



Intelligent document processing



Personalization



Anomaly detection



Industrial equipment monitoring

**Enhance customer
experience**

**Better and faster
decision making**

**Improve business
operations**

Contact center innovation with Amazon Transcribe



Reviewed 83%
more claims

[Learn more](#)



Increased customer sentiment
visibility to 100%

[Learn more](#)



Reduced average handle
time by 24% for a major
food logistics enterprise

[Learn more](#)



Intelligent document processing with Amazon Textract



Reduced document processing time from hours to minutes

[Learn more](#)



Automated 90% of the document classification for claims processing

[Learn more](#)



Automated the ID verification of over 11.4 million recipients preventing government incentives fraud

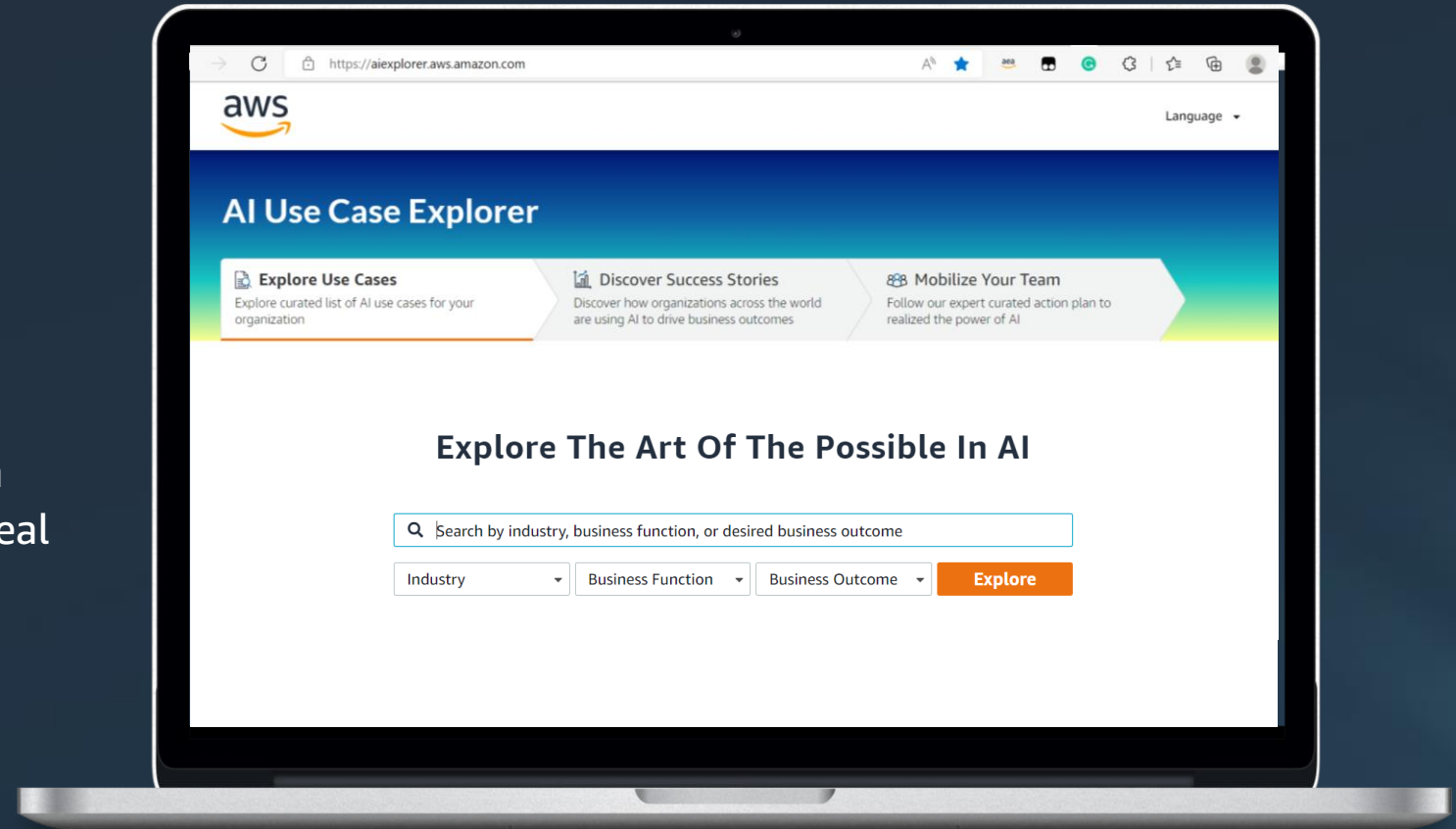
[Learn more](#)





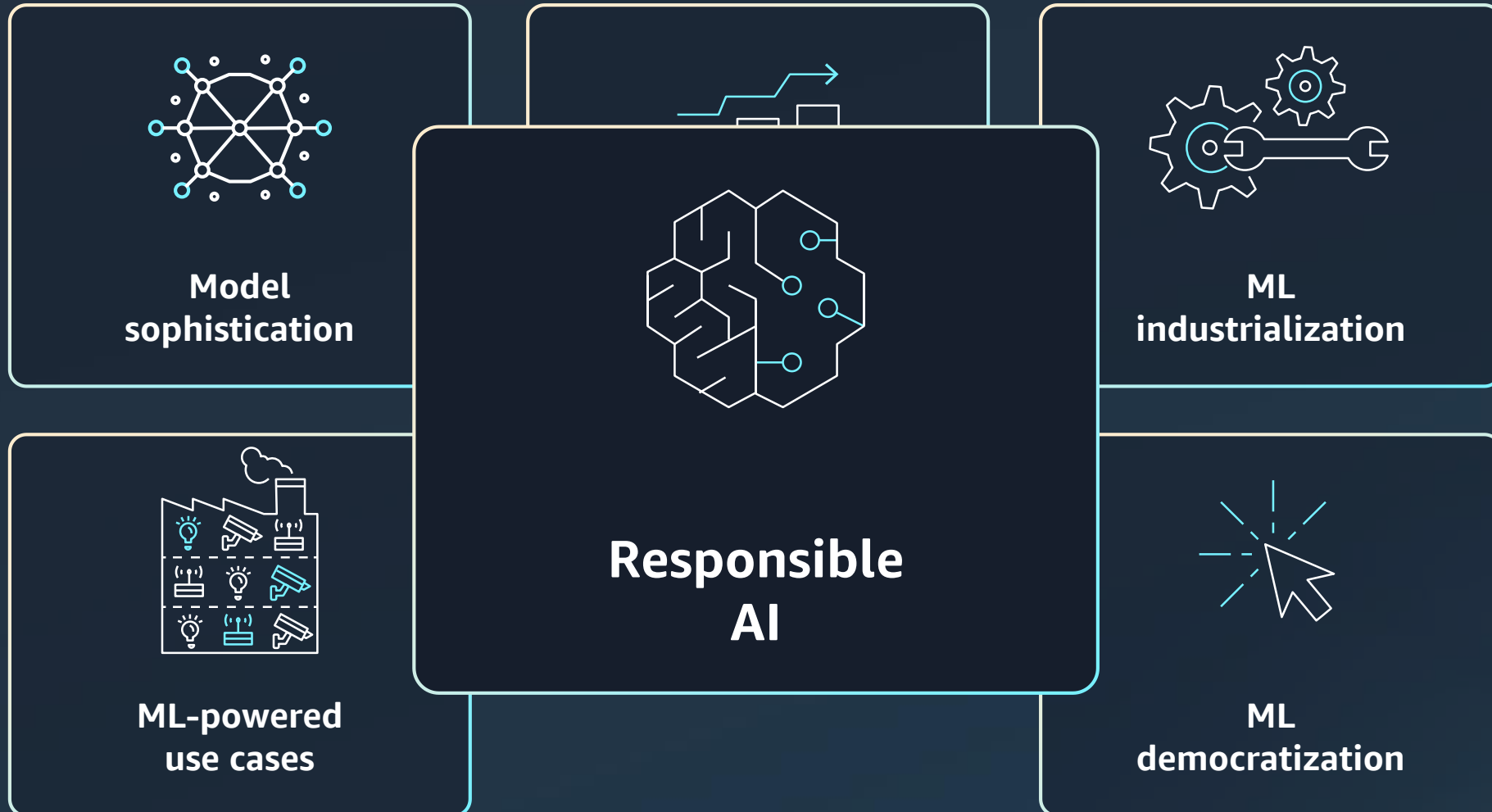
AI Use Case Explorer

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



aiexplorer.aws.amazon.com

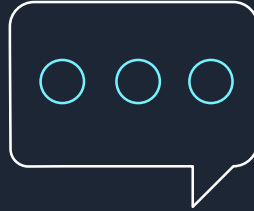
Six key trends driving ML innovation



What is responsible AI?



Fairness



Explainability



Robustness



Privacy and security



Governance



Transparency

[Responsible use of artificial intelligence and machine learning](#)

[Blog post: Protecting Consumers and Promoting Innovation – AI Regulation and Building Trust in Responsible AI](#)

Fairness and bias mitigation course



**Machine Learning
University**

Free, public course on fairness criteria
and bias mitigation

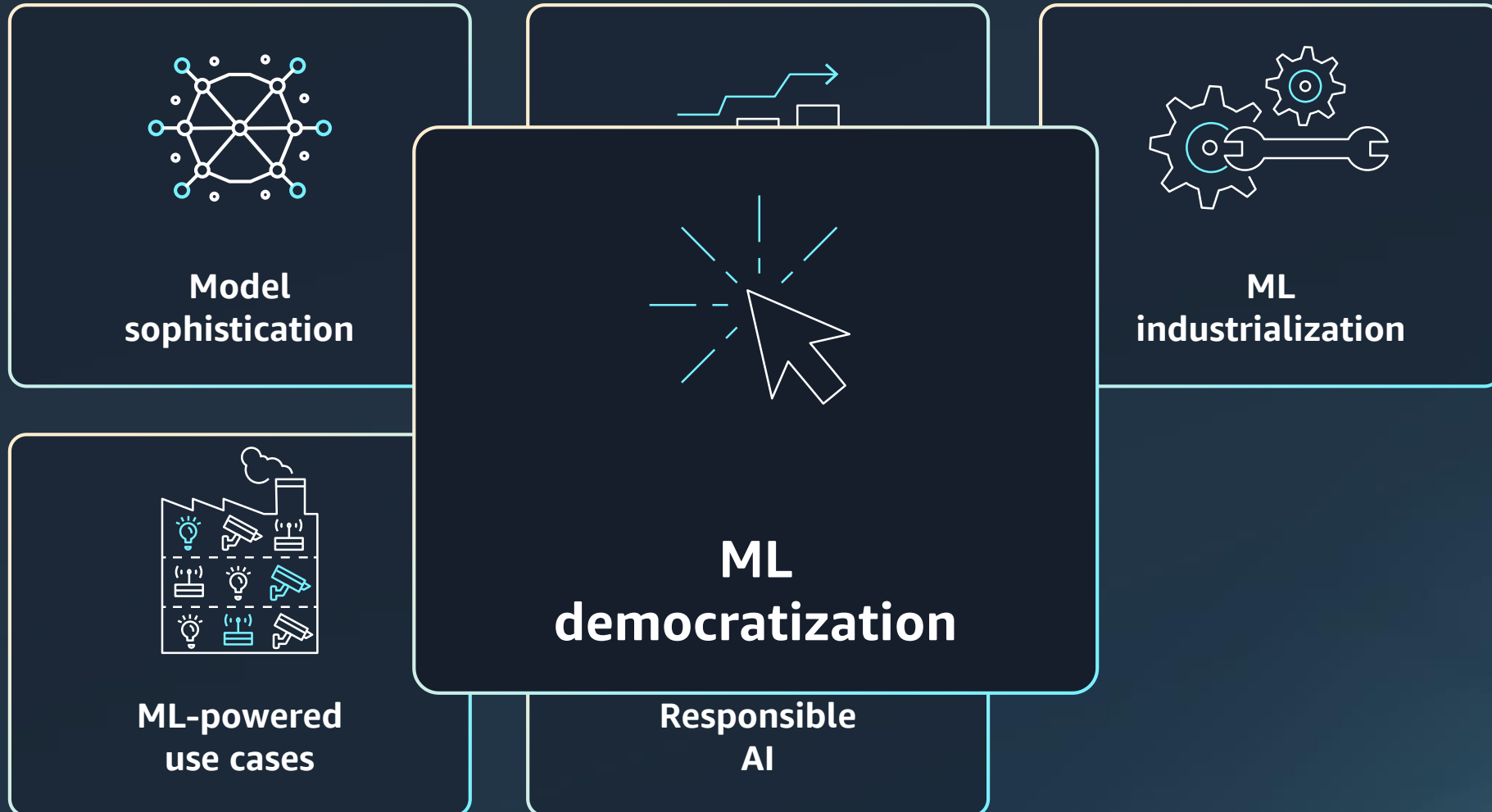
Taught by Amazon data scientists who
train AWS employees on ML

9+ hours of lectures
and hands-on exercises

>>> Get started today

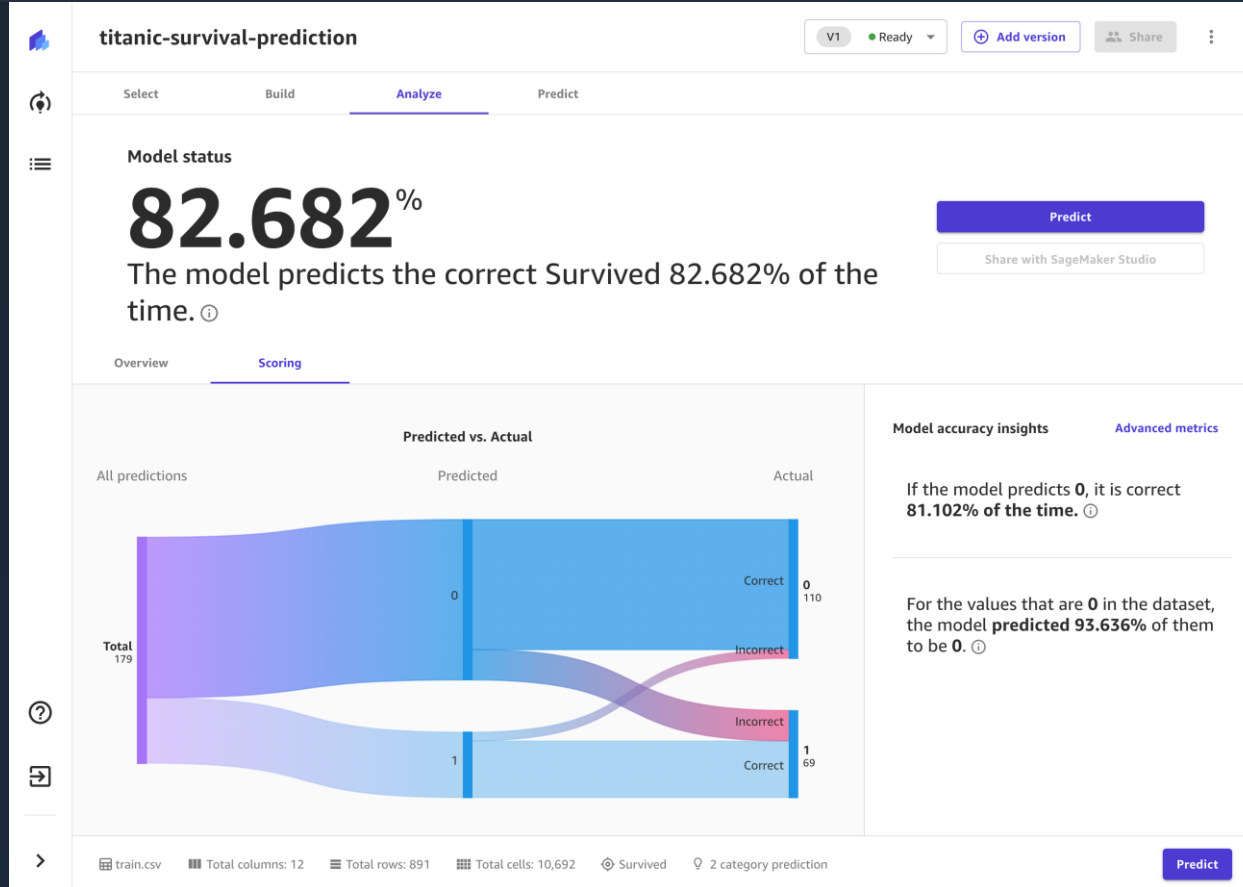


Six key trends driving ML innovation



Amazon SageMaker Canvas

BUILD ML MODELS AND GENERATE ACCURATE PREDICTIONS—NO CODE REQUIRED



SAMSUNG

3M

SIEMENS

SUMMARY

Trends driving ML growth

Model sophistication

Data growth

ML industrialization

ML-powered use cases

Responsible AI

ML democratization

Get started!



TRAINING

In-person, online and
certification programs

Machine Learning University
(MLU)

Immersion days, game days &
deep racer events



IDEATION AND PROOF OF VALUE

AI/ML Specialists

Data Lab

ML Solutions Lab

Acceleration programs



AI SERVICES, NO ML SKILLS REQUIRED

Leverage our AI services
and ready solutions to
add AI capabilities to your
business applications

No code Amazon
SageMaker Canvas



BUILD YOUR OWN MODEL

Build and operationalize
your own models (ML
Ops) using Amazon
SageMaker

AWS Training and Certification

Access the AI & ML learning plan courses built by AWS experts on AWS Skill Builder

- Get started with digital self-paced, on-demand training and ramp-up guides to help you grow your technical skills
- Learn how to apply machine learning, artificial intelligence, and deep learning to unlock new insights and value in your role
- Take the steps today, towards validating your expertise with an AWS Certified Machine Learning – Specialty Certification



<https://bit.ly/3FnxDH7>

Learn your way [explore.skillbuilder.aws](https://skillbuilder.aws) »



Visit the Data & AI/ML resource hub

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

- 6 steps to machine learning success e-book
- 7 leading machine learning use cases e-book
- Machine learning at scale e-book
- Achieving transformative business results with machine learning e-book
- Tackling our world's hardest problems with machine learning e-book
- Accelerating machine learning innovation through security e-book
- ... and more!



<https://bityl.co/FqdC>

Visit resource hub



Thank you for attending AWS Innovate – Data & 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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youtube.com/user/AmazonWebServices



slideshare.net/AmazonWebServices



twitch.tv/aws

Thank you!

