
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

AIM207

Make better decisions with no-code ML using SageMaker Canvas, featuring Samsung

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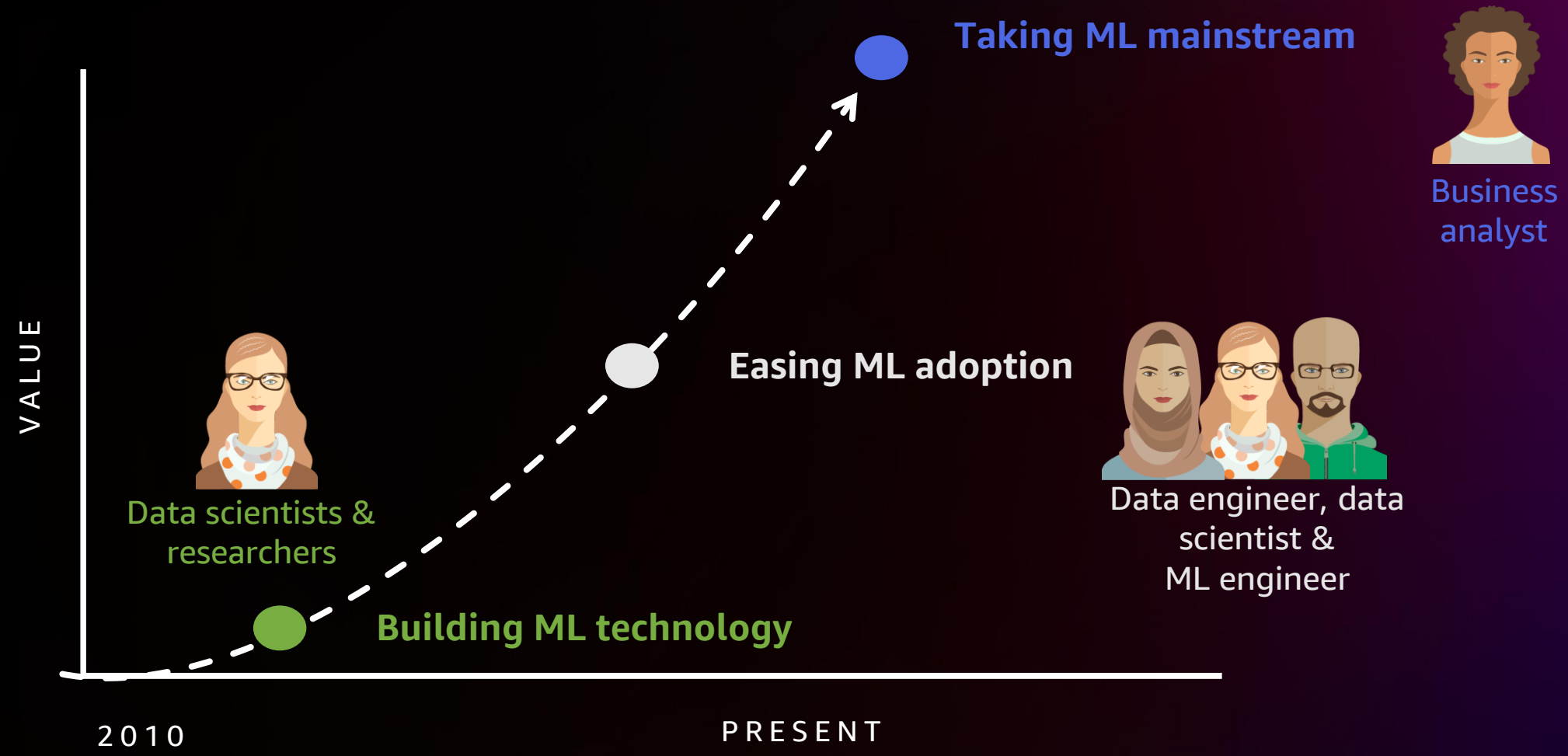
Topics for today

- Democratizing ML: scaling ML value creation
- Demonstration of making better business decisions using Amazon SageMaker Canvas
- Case study: Samsung Electronics
- Wrap-up
- Q&A

ML technology maturity and democratizing ML to accelerate ML-driven value creation



Keys to unblocking the business analyst

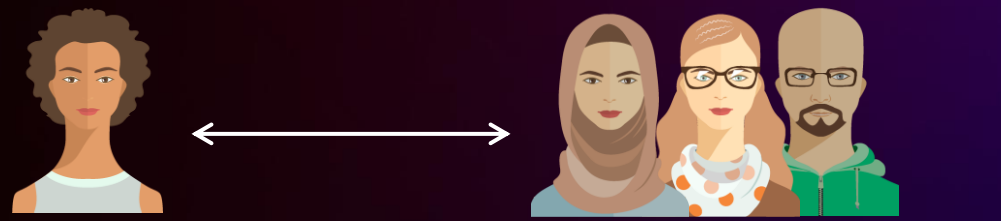
Analysts lack ML expertise, and upskilling is hard

Business needs transparency and validation from experts

1 No-code is the future

In a June 2021 report, Gartner found that by 2024, 80% of tech products and services will be built by people who are not technology professionals
https://gtnr.it/3wOglym

2 Seamless collaboration



Business analyst

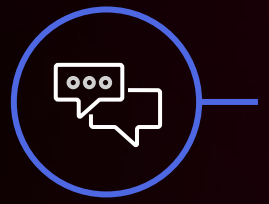
Data engineer, data scientist & ML engineer

Amazon SageMaker Canvas

Build ML models and generate accurate predictions – no code required

Quickly access, explore, and prepare data for machine learning

Built-in AutoML to build models and generate accurate predictions



Analyze model outputs and collaborate with data science teams

Usage-based pricing to avoid licensing fees and reduce TCO

What’s new (2022 YTD)

Amazon SageMaker Canvas announces support for correlation matrices for advanced data analysis 11/07/22
Amazon SageMaker Canvas announces encryption support with customer managed keys for time series forecast models 11/07/22
Amazon SageMaker Canvas supports tags to track and allocate costs incurred by users 10/26/22
Amazon SageMaker Canvas announces Quick build support for time-series forecast models 10/18/22
Amazon SageMaker Canvas supports quicker set up of time-series forecasting models 10/03/22
Amazon SageMaker Canvas supports mathematical functions and operators for richer data exploration 09/29/22
Amazon SageMaker Canvas is now available in the Mumbai, Seoul, Singapore, and Sydney Regions 09/28/22
Amazon SageMaker Canvas announces additional capabilities to explore and analyze data with advanced visualizations 09/08/22
Amazon SageMaker Canvas enables faster onboarding with automatic data import from local disk 08/17/22
Amazon SageMaker Canvas expands capabilities to better prepare and analyze data for machine learning 08/09/22
Amazon SageMaker Canvas announces encryption support with customer managed keys 07/28/22
Amazon SageMaker Canvas announces support for VPC endpoints 06/16/22
Amazon SageMaker Canvas accelerates onboarding with new interactive product tours and sample datasets 06/10/22
Amazon SageMaker Canvas adds new data preparation capabilities and usability updates 05/05/22
Amazon SageMaker Canvas is now available in the AWS Asia Pacific (Tokyo) region 04/14/22

Opportunities for making better decisions

Sales and marketing

- Sales conversion
- Sales forecasting
- Propensity to churn
- Customer lifetime value prediction
- Marketing mix modeling

Finance and accounting

- Credit risk scoring
- Delayed payments prediction
- Fraud detection
- Portfolio optimization
- Account payables automation

Operations and logistics

- Demand forecasting
- Delivery time prediction
- Predictive maintenance
- Predictive quality

and many more…

Do you have data? Ask it questions!

Tabular is the most common data type readily available to businesses

Asking your data a question:

"Can the **target column** value be explained by/predicted from the other column values?"

Examples of tabular data

Var 1	Var 2	Var 3	Var 4	Var 5	Target
11.0656	7.7798	12.9536	9.4292	3/1/2018	9.6
8.5304	1.2543	11.3047	5.1858	3/2/2018	10.5
5.4827	-10.3581	10.1407	7.0479	3/3/2018	9.4
8.5374	-1.3222	12.022	6.5749	3/4/2018	9.8
11.7058	-0.1327	14.1295	7.7506	3/5/2018	4.5
5.9862	-2.2913	8.6058	7.0685	3/6/2018	4.3
8.4624	-6.1065	7.3603	8.2627	3/7/2018	**10.1**

Var 5	Target
/1/2018	Bad
/2/2018	Bad
/3/2018	Bad
/4/2018	Bad
/5/2018	Good
3/6/2018	Good
3/7/2018	Bad

No-code ML

Making better business decisions:
How to predict manufacturing end-of-line quality using SageMaker Canvas

Manufacturing quality engineer wants to predict end-of-line quality using mid-line tests and equipment sensor readings

Up-/mid-stream tests | Sensor readings | Digitize optical inspection data | EOL quality

N21

	A	B	C	D	E	F	G	H	I	J
1	Test1	Gate1	Gate2	Reading1	Reading5	Reading6	Reading7	Xoffset	Yoffset	EOLTest
2	L	NORMAL	HIGH	80	7998.46	72.03854	0.032772	21.22587	17.6728	Fail
3	L	LOW	HIGH	77	7730.573	67.08473	0.920558	23.53545	16.012	Fail
4	L	LOW	HIGH	77	7702.598	77.68998	0.008467	22.05945	16.07217	Fail
5	L	LOW	HIGH	77	7701.867	77.61067	0.752178	22.02701	15.92174	Fail
6	L	LOW	HIGH	77	7699.826	67.69932	0.00831	23.89724	15.69795	Fail
7	S	HIGH	NORMAL	76	7603.656	136.0996	0.606646	14.11135	9.656831	Fail
8	L	LOW	HIGH	76	7600.318	78.37614	0.008194	20.48083	15.68505	Fail
9	L	LOW	HIGH	76	7600.298	78.83789	0.352657	20.59402	15.47902	Fail
10	S	HIGH	NORMAL	76	7599.836	140.6925	0.598734	13.60846	10.16249	Fail
11	S	HIGH	NORMAL	76	7596.798	140.0011	0.537771	15.18518	9.044426	Fail
12	S	LOW	NORMAL	76	7497.453	152.9493	-0.02966	11.69514	10.23416	Pass

Samsung Electronics: Journey to AI/ML as business user

Dooyong (Derrick) Lee
Marketing Intelligence Group
SAMSUNG Memory

Dooyong Lee

Senior Professional
SAMSUNG Memory Marketing Intelligence

Agenda

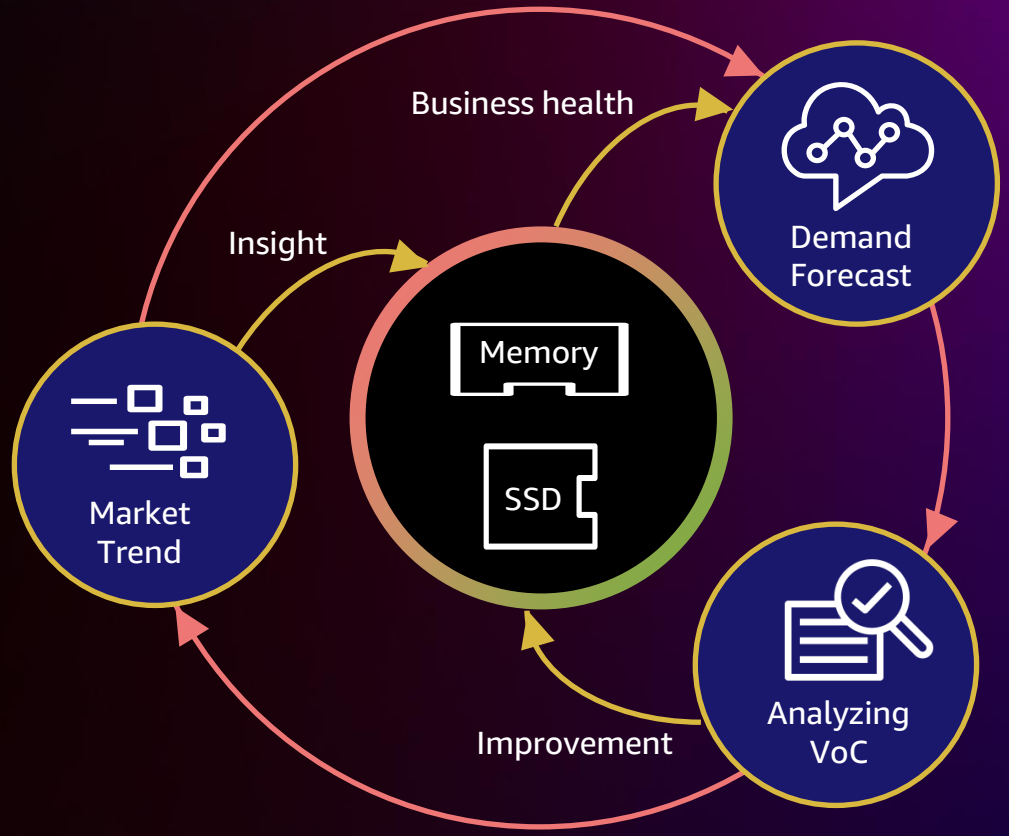
1. Introduction
2. Changing dynamics of the future memory industry
3. Need to transform to be the “citizen developer”
4. Journey with AWS
5. Next step

SAMSUNG Memory Marketing Intelligence Group

Lead a technological innovation

SAMSUNG ELECTRONICS

- Device solutions
  - Memory business
    - Marketing intelligence



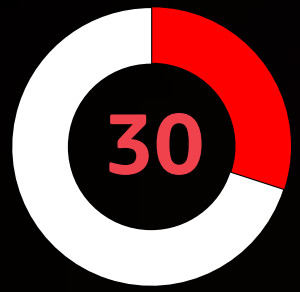
- Having business domain knowledge
- Analyzing market trend with research & data corp.
- Predicting short-/long-term memory demand

But…

- No! IT background
- Never! experience on using code

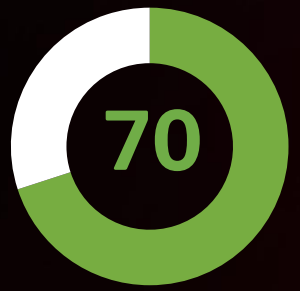
What is good demand forecasting?

Comfortable work life



Demand fluctuates according to what supervisors think

Good for promotion

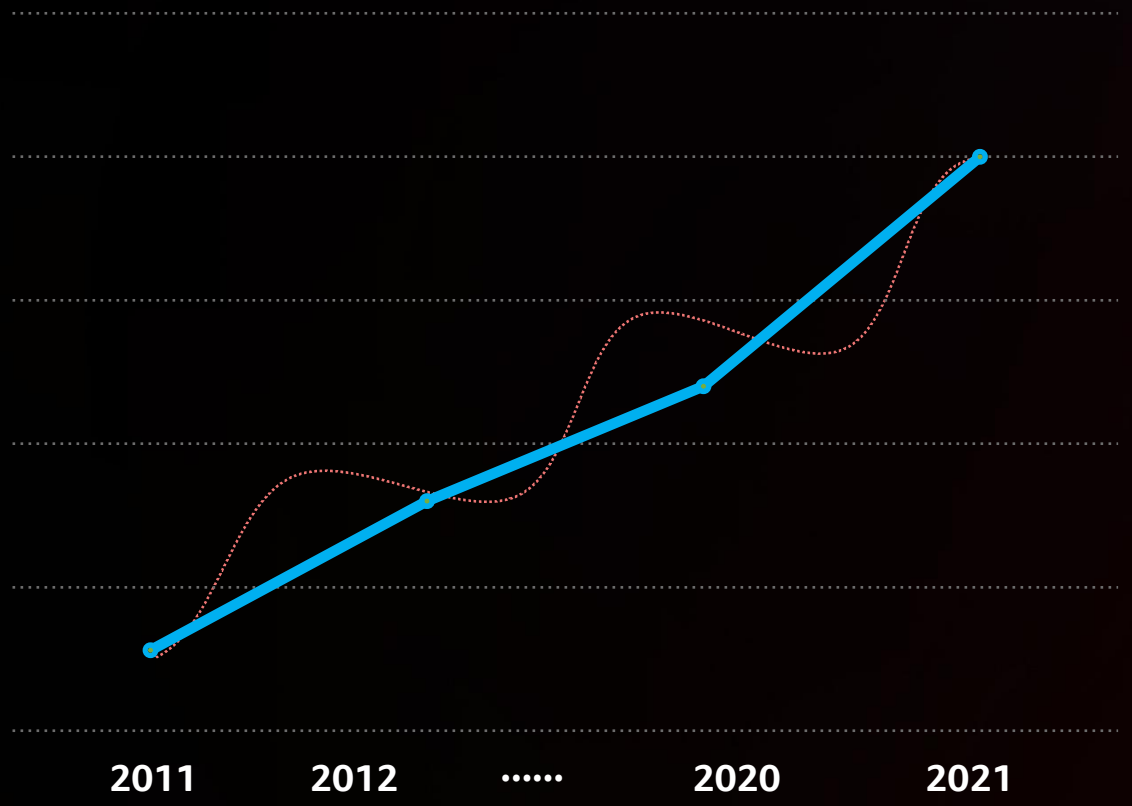


Demand forecasts close to actual results

Design the future

Creating a future beyond predicting the future

What is our score in the past?

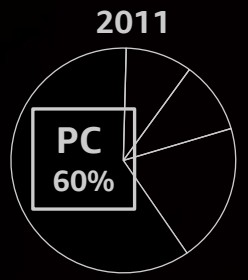


SAMSUNG Memory

100

Right then, different now

Simple system



Simple factors

Customer Info

Information

Operation

Complex system

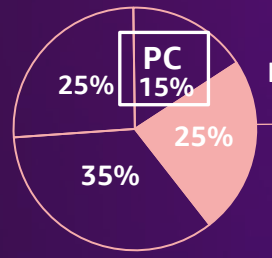
SVR

Mob

PC

Auto

IOT ....



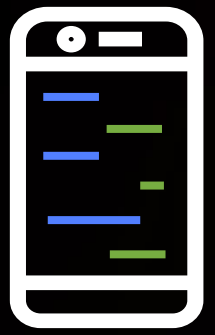
New applications
Automotive
Internet of Things
Wearable devices

Multiple factors

- Component issue
- Global Economy
- Global SCM
- …

Data collection & analysis

Demand forecasting methods and challenge

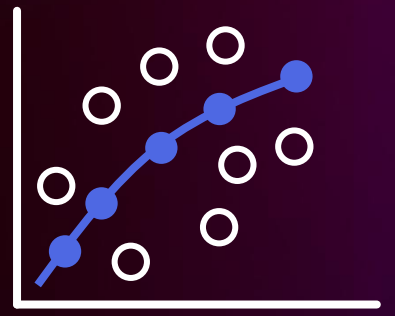


VoC

Volatility

Research firm

Accuracy



Simple regression

Inflection point

Need to transform

Uncertainty in the future

Rapid technological change

Complexity market demand

Volatility of business

To be the *"citizen developer"*

Data-driven analytics & decision

"Productivity"

"Accuracy"

"Immediate use"

And "easy to use"

Solution on AWS

AWS News Blog – https://aws.amazon.com/blogs/aws/

Announcing Amazon SageMaker Canvas – a visual, no code machine learning capability for business analysts

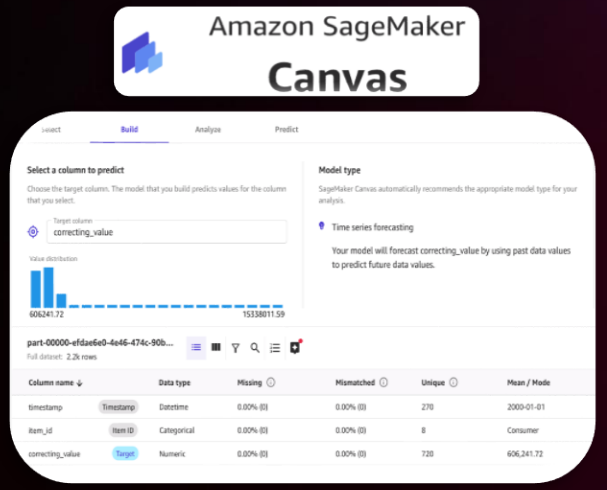
Today, I'm excited to announce the general availability of Amazon SageMaker Canvas, a new **visual, no code** capability that allows business analysts to **build ML models** and generate accurate predictions **without writing code or requiring ML expertise**. Its intuitive user interface lets you browse and access disparate data sources in the cloud or on-premises, combine datasets with the click of a button, train accurate models, and then generate new predictions once new data is available.

Just another ML no-code platform?

Demand forecast collaboration with AWS

Engagement from AWS

- Immersion Day: 1 day in May
- Data Lab: 4 days in August
- Post lab: TBD – November



ASML
SAMSUNG

Data center co-research AWS/ASML/Samsung

AWS re:Invent
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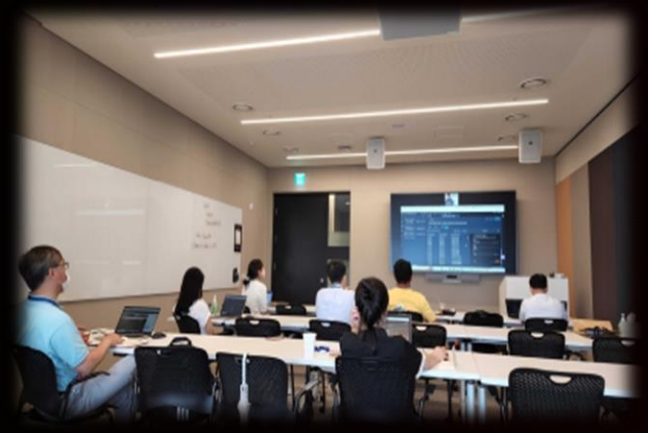
AWS re:Invent

- Nov. 30th 2:30 p.m.

Kickoff meeting

- April 27, 2022



Project completion with AWS

- Prediction of PC set demand for the upcoming 8 quarters
- Using a historical PC demand dataset and leveraging related time series, including forecasted GDP changes, oil price, and world population
- Create an Amazon Sagemaker Canvas model with time series forecasting

But, more challenges

01.
Understand AWS

- Not famillar with IT
- Starting from knowing what Amazon S3 is

02.
As data scientist

- Understanding data structure
- Too many columns; transform it

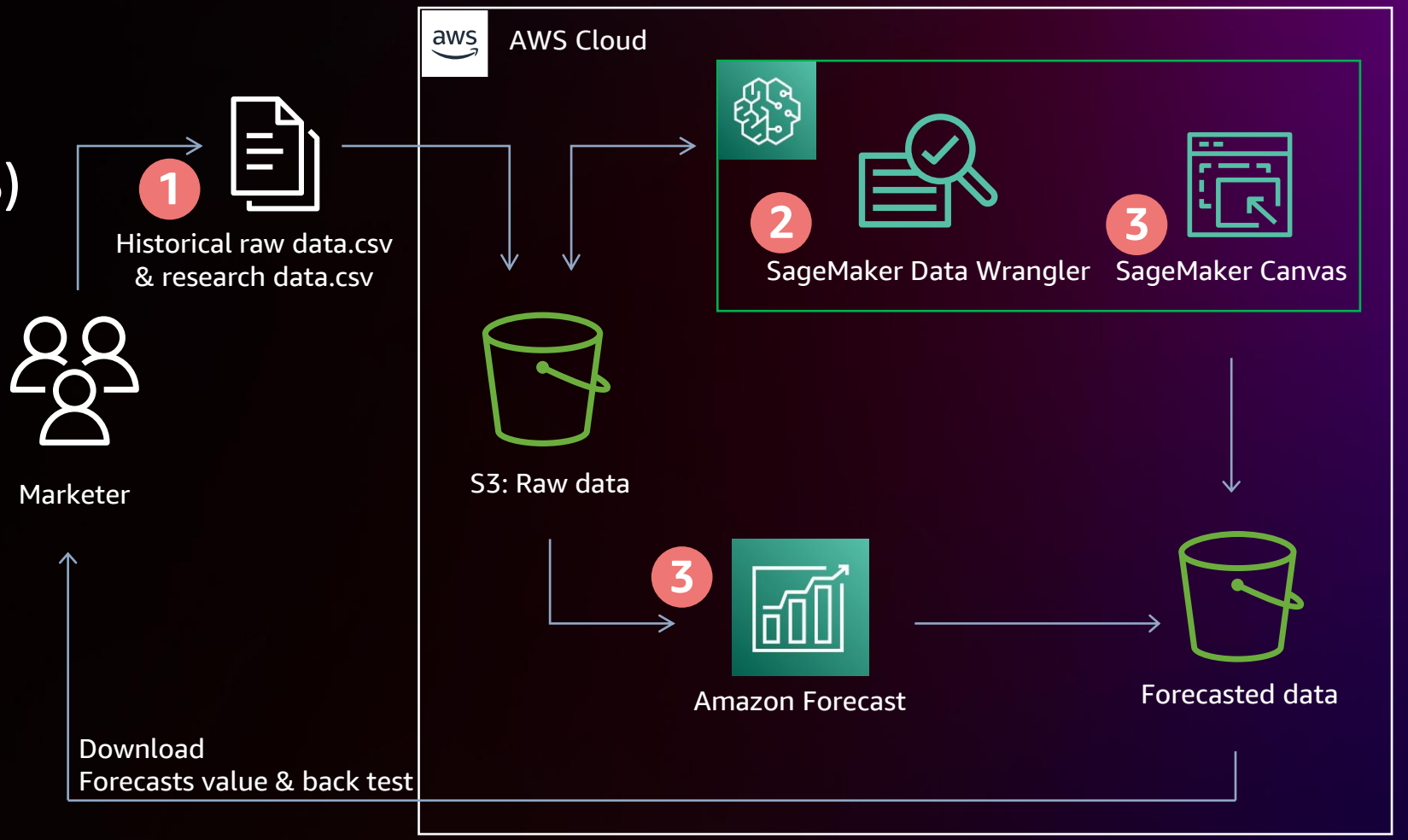
03.
Outcome

- Doubting negative forecasting
- What happened behind the tool

Demand Forecast Architecture

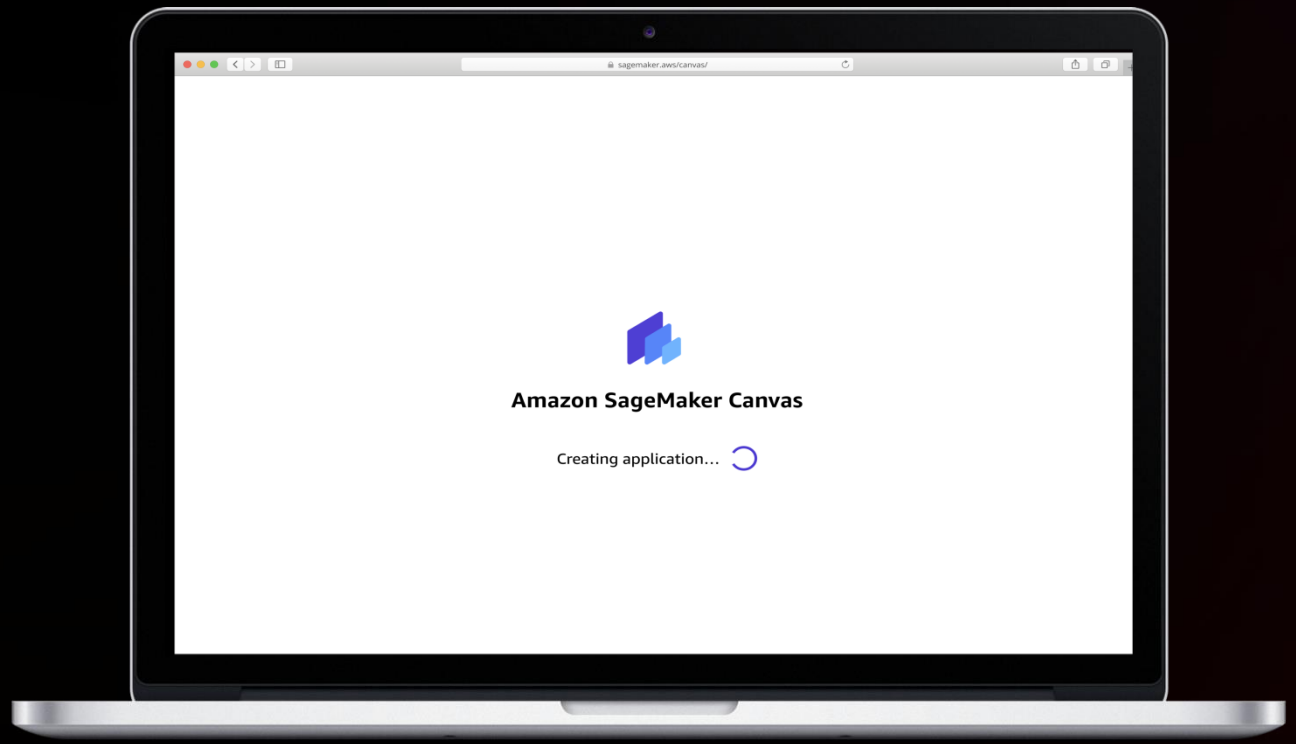
Only using AWS Management Console – no code, no build application

1. Two datasets for target time series (TTS) and related time series (RTS)
2. Pre-processing to transform the raw data to predefined formats
3. Performing time-series forecast and what-if analysis



How we use SageMaker Canvas: Step 1

Select | Build | Analyze | Predict



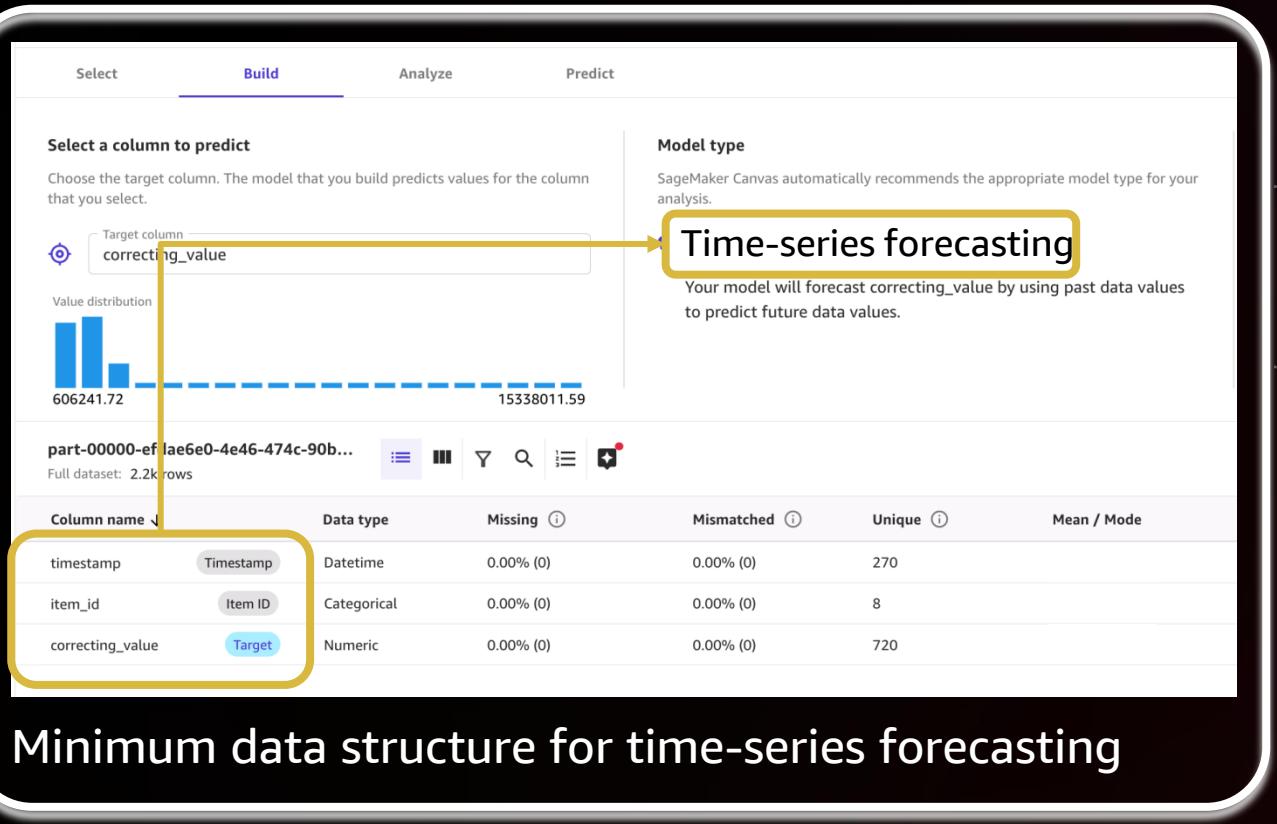
Easily access and use with the console or AWS IAM Identity Center anywhere

Connect **data source from local disk and Amazon S3**

Simple setup for SageMaker Canvas without IT administrator

How we use SageMaker Canvas: Step 2

Select | **Build** | Analyze | Predict



Minimum data structure for time-series forecasting

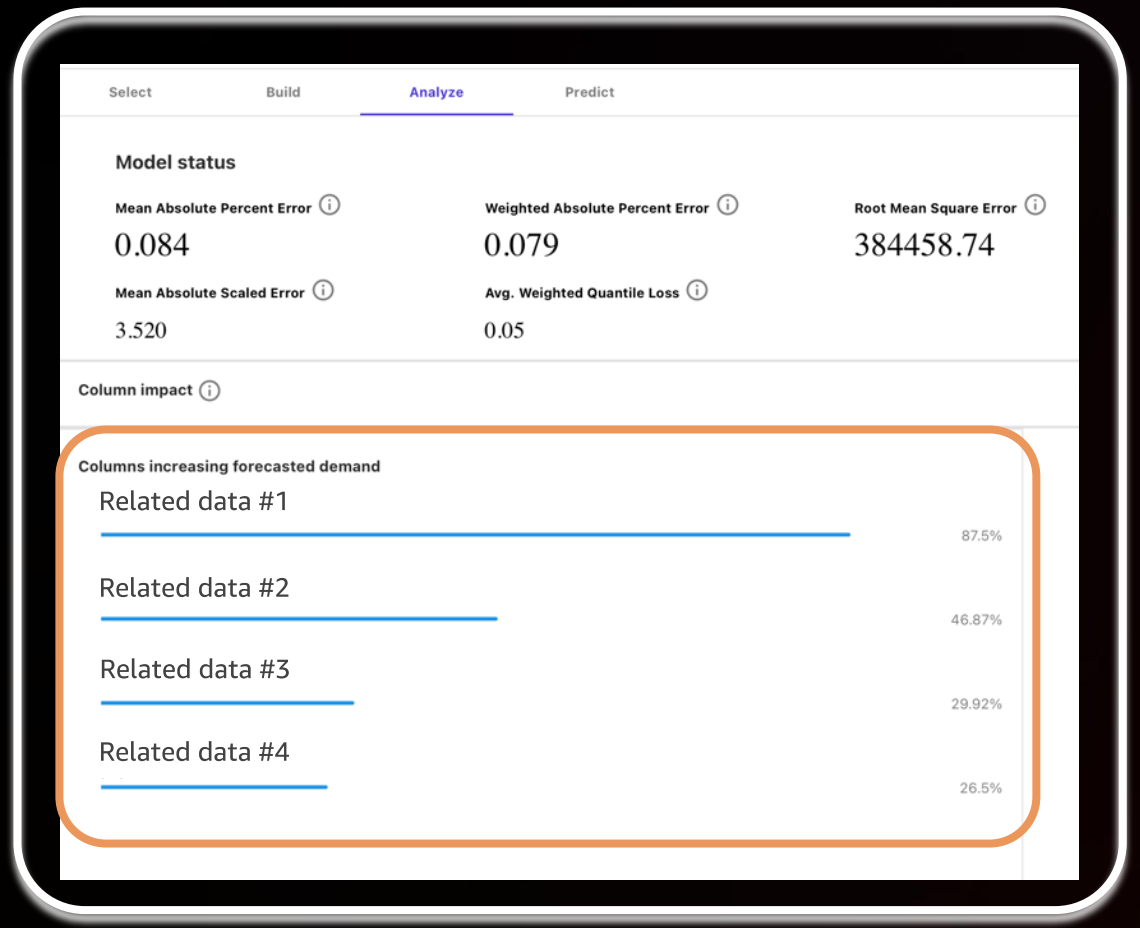
Quickly understand data with an intuitive and Visual user interface

Recommend the appropriate ML mode according to the data structure

Training result within ~20 minutes with **quick build for regression and classification problems**, or with in ~2 hours with **standard build for time-series forecast problems**

How we use SageMaker Canvas: Step 3

Select | Build | **Analyze** | Predict



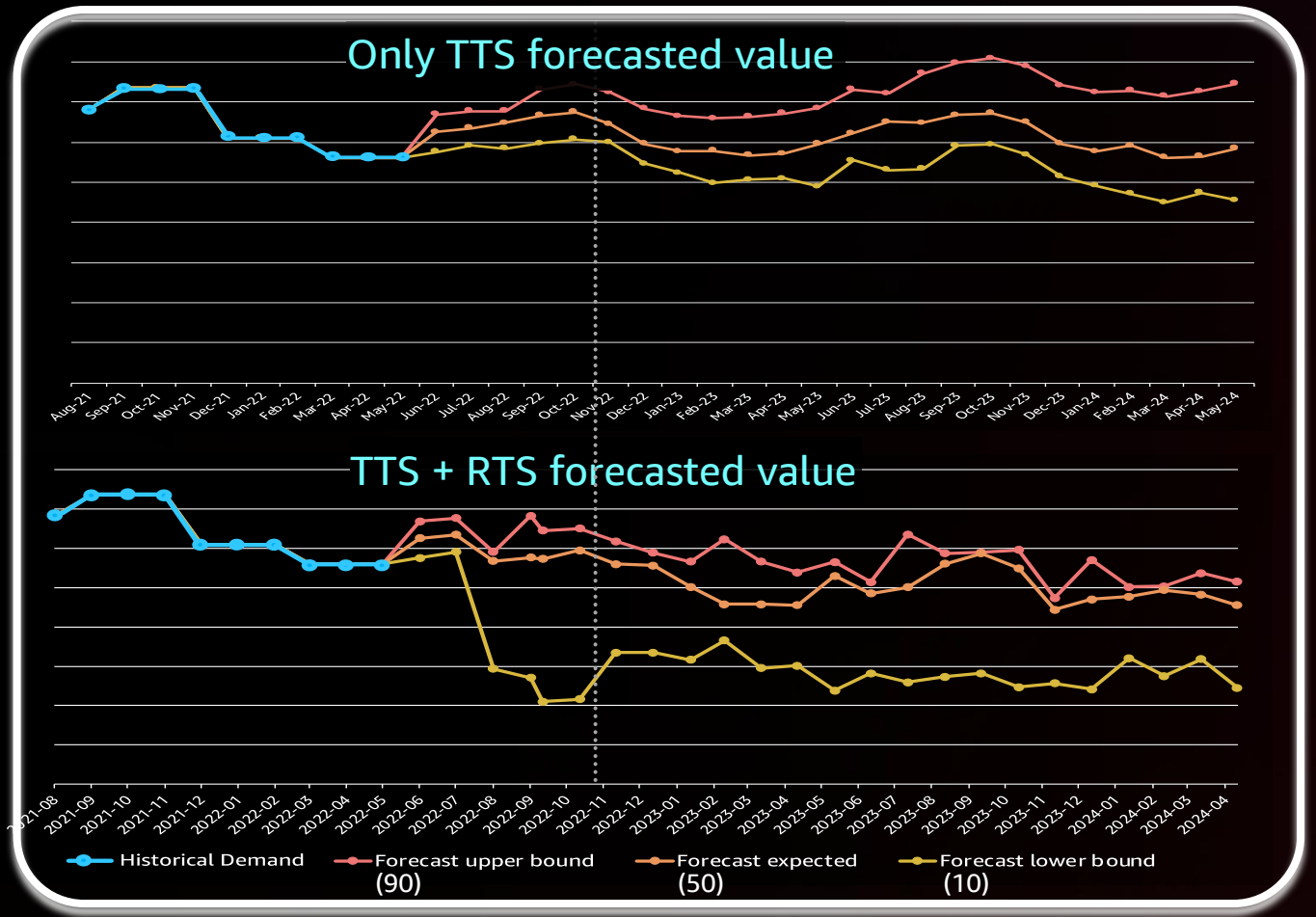
Providing **model status and expected accuracy**

Providing **the main factors (relate data) and scores** of predictions

In order to get better performance at re-training model, **remove unnecessary related data**

How we use SageMaker Canvas: Step 4

Select | Build | Analyze | **Predict**

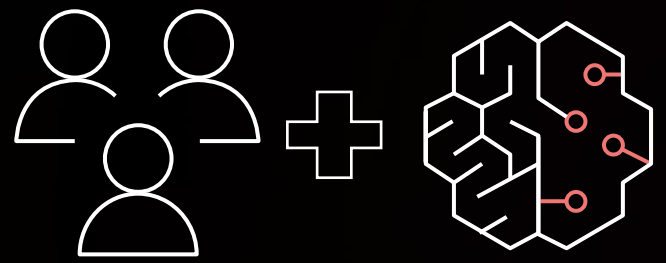


Predicted output right from the console for single items

Download whole forecasted value CSV file for all items and make our own graph

Forecasting expected value within **upper bound and lower bound range**

Positive changes after using SageMaker Canvas

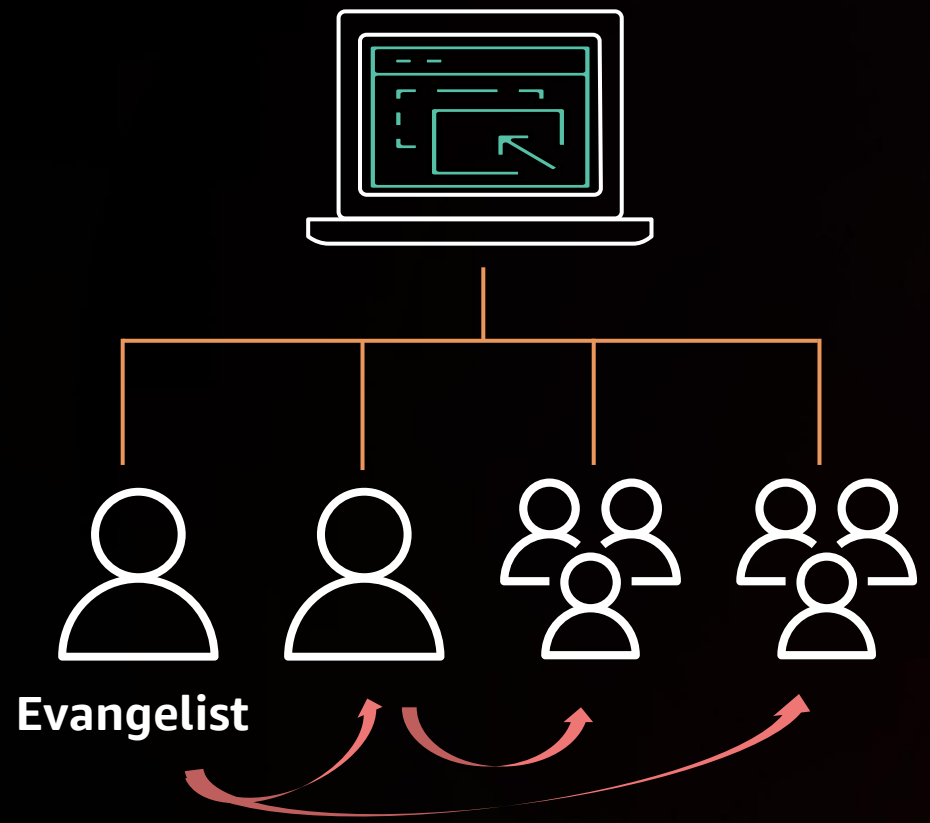


- Business user AI/ML
- Data-driven decision-making
- Forecast accuracy ↑

Challenges lie ahead

- How would we explain it?
- Reliable and actionable
  - Can we truly trust the predictions made by AI/ML and make executions based those?
- How can we make better demand forecast next time?

Next step:



Democratize AI/ML

Wrap-up and Q&A

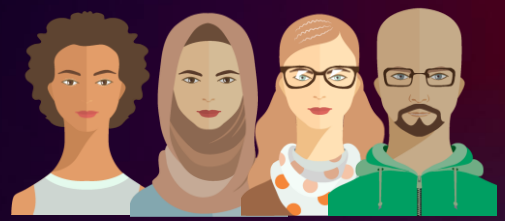
Keys to democratizing ML

1 No-code is the future

2 Seamless collaboration

Give the analysts best-practice ML without code

Support and accelerate the end-to-end lifecycle



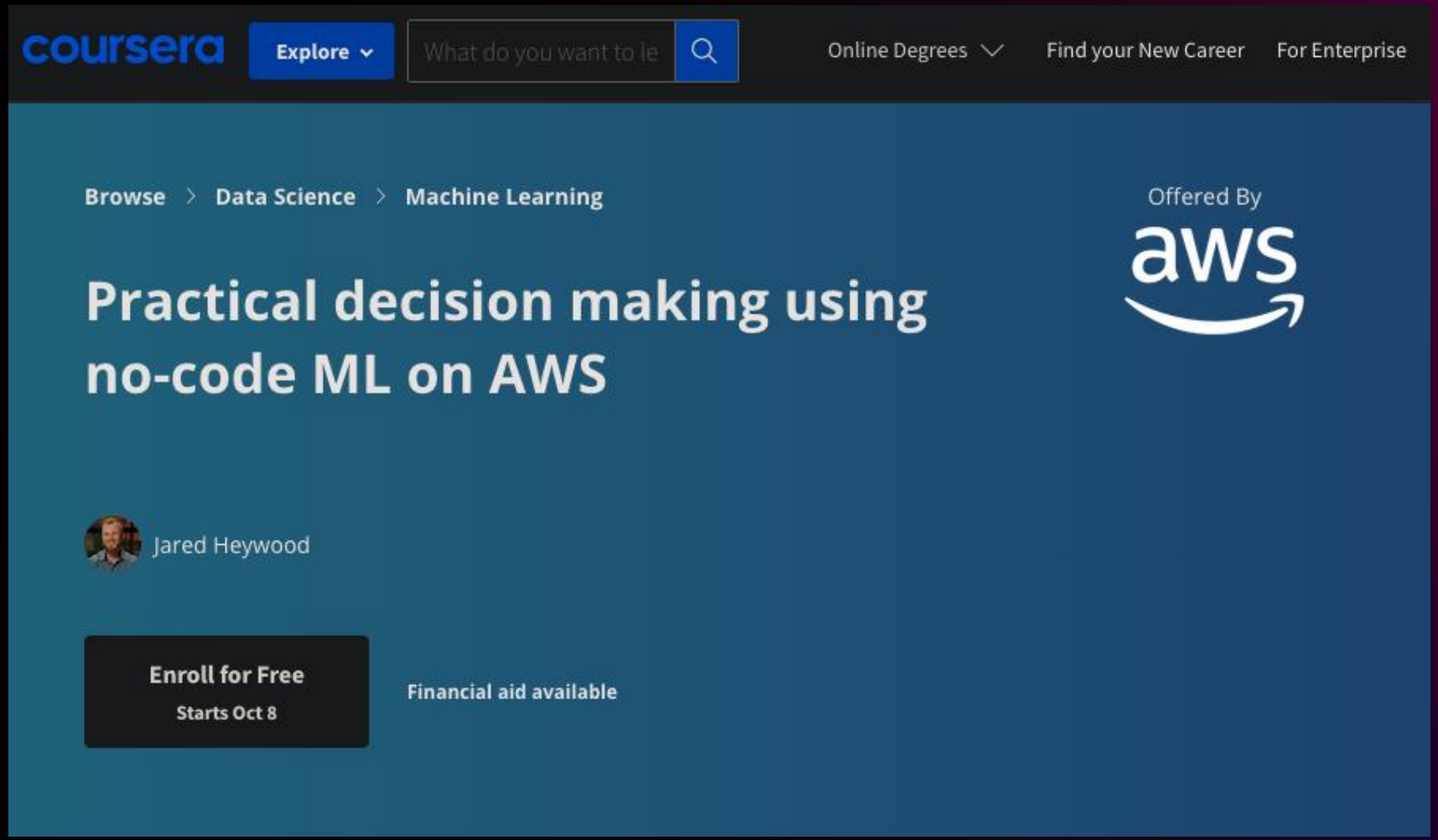
Business analysts and ML professionals operating as one team

Get hands-on with SageMaker Canvas at AWS re:Invent

Session ID	Title	Session type	Date/time	Location
AIM337	Build better ML models for business decisions using Amazon SageMaker Canvas	Workshop	Thursday 12/1 11:45am – 1:45pm	Level 1, Forum 118, Caesars Forum
AIM337-Repeat	Build better ML models for business decisions using Amazon SageMaker Canvas	Workshop	Thursday 12/1 2:45pm – 4:45pm	Level 1, Forum 118, Caesars Forum
TNC107	Use Amazon SageMaker Canvas to make your first ML model	Lab	Thursday 12/1 1:30pm – 3:00pm	Level 2, Bellini 2103, Venetian

Go watch the recording for ***FSI305 Use AWS no-code services to build a credit default risk model***

Practical decision-making using no-code ML on AWS



https://www.coursera.org/learn/no-code-ml-aws

ML professional? Try these low-code ML sessions

- AIM201: Accelerate the ML lifecycle with Amazon SageMaker low-code tools
- AIM314: Accelerate your ML journey with Amazon SageMaker low-code tools
- AIM322: Accelerate data preparation with Amazon SageMaker Data Wrangler
- AIM326-R: Prepare data and model features for ML with ease, speed, and accuracy
- AIM326-R1: Prepare data and model features for ML with ease, speed, and accuracy
- AIM329-R: Get started with ML faster using Amazon SageMaker JumpStart
- AIM329-R1: Get started with ML faster using Amazon SageMaker JumpStart
- BOA402: Using AutoML to develop deep learning solutions automatically

Learning more

SCALE ML VALUE CREATION

Business Executives

Scale your ML efforts by offering your business teams a way to build ML with no code

BUILD ML WITH NO CODE

Business Analysts & Domain Experts

Learn how to use Canvas and start building ML-powered predictions with no code

ENABLE COLLABORATION

Platform Admins

Onboard analysts in Canvas and data scientists in Studio to enable collaboration

http://aws.amazon.com/sagemaker/canvas

We want to hear from you!

Thank you!

Shyam Srinivasan

Principal Product Manager
Amazon Web Services

Danny Smith

Principal, AI/ML Strategy
Amazon Web Services

Dooyong (Derrick) Lee

Manager of Marketing Intelligence
SAMSUNG Memory

Please complete the session survey in the **mobile app**