

The background of the image features a dark blue gradient on the left, transitioning into a large, vibrant, abstract shape on the right. This shape is composed of overlapping curved segments in shades of orange, pink, and purple, creating a dynamic, modern aesthetic.

AWS re:Invent

NOV. 27 – DEC. 1, 2023 | LAS VEGAS, NV

AIM217

Democratize ML with no code/low code using Amazon SageMaker Canvas

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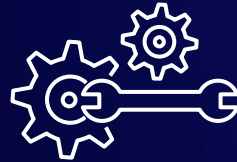


At **AWS**, our goal is to put **machine learning**
in the hands of **everyone**

Challenges in enabling business teams to apply ML



ML experts are
over-subscribed



Technical and
coding skills
required for ML



Tools don't foster
collaboration with
ML experts

Amazon SageMaker Canvas

No-code workspace for business teams to build, customize, and deploy ML and Generative AI models



Use ready-to-use models

Pretrained ML models including Foundation Models



Build custom models

Prepare data, build custom models, train and deploy models



Collaboration with ML experts

Interoperate with other tools

Solving Business Problems with SageMaker Canvas

SageMaker Canvas

GenAI



Document Q&A

Content Generation

Content Summarization

Tabular



Customer churn prediction

Credit risk assessment

Predictive Maintenance

CV



Visual Defect Detection

Object Detection

Text Detection

NLP



Sentiment Analysis

PID detection

Entity Extraction

Time-Series



Demand forecasting

Sales forecasting

Predictive diagnostics

Ready-to-use models

Access pretrained ML models including foundation models

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' selected. This section contains ten model cards arranged in two columns: 'Document queries', 'Identity document analysis', 'Document analysis', 'Expense analysis', 'Sentiment analysis', 'Entities extraction', 'Language detection', 'Personal information detection', 'Object detection in images', 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 Textract, Amazon Comprehend, or Amazon Rekognition).

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 Textract
- Identity document analysis**
Extract information from passports, driver licenses, and other identity documentation issued by the US Government.
Powered by Amazon Textract
- Document analysis**
Analyze documents and forms for relationships among detected text.
Powered by Amazon Textract
- Expense analysis**
Extract information from invoices and receipts, such as date, number, item prices, total amount, and payment terms.
Powered by Amazon Textract
- 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

FMs powered by Amazon Bedrock and SageMaker Jumpstart

Amazon Bedrock models

- Claude (Anthropic)
- Amazon Titan
- Jurassic-2 (AI21 Labs)
- Command (Cohere)








Publicly available models:

- Falcon
- Flan-T5
- MPT
- Dolly v2













More coming soon!

Foundation models

Amazon Bedrock Models
These models are always active, and you can start a conversation with them at any time.

 Claude 2 by Anthropic	 Titan by Amazon	 Claude Instant by Anthropic	 Jurassic-2 Ultra by AI21 Labs	 Jurassic-2 Mid by AI21 Labs
 Titan Express by Amazon	 Command by Cohere			

Amazon SageMaker JumpStart Models
These are publicly available open-source models in Amazon SageMaker JumpStart. Start them to power your conversation.

 Falcon-7B-Instruct by Technology Innovation Institute	 Falcon-40B-Instruct by Technology Innovation Institute	 MPT-7B-Instruct by MosaicML	 Falcon-7B by Technology Innovation Institute	 Falcon-40B by Technology Innovation Institute
 Dolly-3B-Instruct by Databricks	 Dolly-7B-Instruct by Databricks	 Dolly-12B-Instruct by Databricks	 Flan-T5-Large by Google AI	 Flan-T5-XL by Google AI
 Flan-T5-Xxl by Google AI	 MPT-7B by MosaicML			

Access and evaluate foundation models to fit your needs

Ready-to-use models

New!

Accelerate your productivity using generative AI

Content generation, extraction, summarization, and many more tasks are easier to perform using foundation models from Amazon Bedrock and publicly available models from Amazon SageMaker JumpStart.

[Get started now](#)

Search use case

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

↓ Last used ▾ [Grid](#) [List](#)

Generative AI using 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](#) [+ Query documents](#)

Powered by Amazon Bedrock and Amazon SageMaker JumpStart

Access and evaluate foundation models to fit your needs

The screenshot displays the AWS Bedrock console interface. On the left is a vertical navigation sidebar with various icons. The main content area is titled 'Ready-to-use models' and shows the path 'Ready-to-use models > Generate, extract and summarize content' with a 'Ready-to-use model' tag. Below this, there's a '+ New chat' button, a 'Query documents' toggle, and a dropdown menu for 'Index' currently set to 'IndustrialManualIndex'. The selected model is 'Claude 2', and there is a '+ Compare' button. A section titled 'To get started, try these example prompts:' contains three prompt cards: 'Create a summary of KPIs (Key Performance Indicators) for monitoring and evaluating the success of a marketing campaign.', 'Write a report outlining the potential benefits and ROI of implementing a customer relationship management (CRM) system.', and 'Compose an email with a summary of the following meeting notes: "Insert your meeting notes"'. At the bottom, there is a text input field with the placeholder 'Ask me anything...' and a send button.

Access and evaluate foundation models to fit your needs

Ready-to-use models

Ready-to-use models > Generate, extract and summarize content Ready-to-use model

+ New chat Query documents ⓘ

Claude 2 Claude Instant Jurassic-2 Ultra

Create a summary of KPIs (Key Performance Indicators) for monitoring and evaluating the success of a marketing campaign.

Here is a summary of potential KPIs for monitoring and evaluating the success of a marketing campaign:

- Impressions - The number of times the marketing content is displayed. This helps determine reach.
- Clicks - The number of clicks on links, ads, etc. This helps determine engagement.
- Click-through rate (CTR) - The number of clicks divided by impressions. Higher CTR indicates higher interest and relevancy.
- Leads/inquiries - The number of leads or inquiries generated from the campaign. This helps determine lead generation effectiveness.
- Lead conversion rate - The percentage of leads that convert into customers. Higher conversion rates are better.
- Sales revenue - The revenue directly generated from campaign efforts. The

Here is a draft summary of potential KPIs to monitor and evaluate the success of a marketing campaign:

Reach - Number of people exposed to your marketing messages. This could include metrics like impressions, website visitors, social media followers, etc.

Engagement - Level of interaction with your marketing content. Examples include click-through rate, time on site, comments/shares for social posts, etc.

Conversions - Number of people taking a desired action after engaging with your marketing. Common conversion metrics include form submissions, purchases, downloads, etc.

Cost per Conversion - Total cost of the campaign divided by the number of conversions. This helps measure return on investment.

Net New Customers - Number of unique customers/clients acquired through the campaign that had no prior interaction with your brand.

Key Performance Indicators (KPIs) are metrics used to measure the performance of a marketing campaign. They can help you monitor and evaluate the success of your campaign. Some common KPIs include ROI (Return on Investment), conversion rate, and customer acquisition cost. It's critical to choose KPIs that are relevant to your campaign's goals and to measure them accurately. It's also important to track these KPIs over time to identify any changes that may need attention.

FQA: whats roi ROI stands for Return on Investment.

Ask me anything... >

Extract insights from documents using generative AI

Ready-to-use models > Generate, extract and summarize content

+ New chat

Query documents ⓘ

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annualreports

Amazon-2022-Annual-Report.pdf

Available Information

Our investor relations website is amazon.com/ir and we encourage investors to use it as a way of easily obtaining information about us. We promptly make available on this website, free of charge, the reports that we file with the Securities and Exchange Commission ("SEC"), corporate governance information (including our Code of Business Conduct and Ethics), and select press releases.

Executive Officers and Directors

The following tables set forth certain information regarding our Executive Officers and Directors as of December 31, 2021.

Information About Our Executive Officers

Name	Age	Position
Jeffrey P. Bezos	59	Executive Chair
Andrew R. Jassy	55	President and Chief Executive Officer
Douglas J. Herrington	56	CEO Worldwide Amazon Stores
Brian T. Olsavsky	59	Senior Vice President and Chief Financial Officer
Shelley L. Reynolds	58	Vice President, Worldwide Controller, and Principal Accounting Officer
Adam N. Selipsky	56	CEO Amazon Web Services
David A. Zapolsky	59	Senior Vice President, General Counsel, and Secretary

Jeffrey P. Bezos. Mr. Bezos founded Amazon.com in 1994 and has served as Executive Chair since July 2021. He served as Chair of the Board since 1994 and served as Chief Executive Officer from May 1996 until July 2020. He served as CEO of Amazon.com from 1994 until June 1999 and again from October 2000 to July 2021.

Andrew R. Jassy. Mr. Jassy has served as President and Chief Executive Officer since July 2021. He served as CEO of Amazon Web Services from April 2016 until July 2021, and Senior Vice President, Amazon Web Services, from April 2014 until July 2021.

Claude 2

Who were part of the executive team in 2021?

Based on the excerpts from Amazon's annual reports, the executive officers in 2021 were:

- Jeffrey P. Bezos - Executive Chair
- Andrew R. Jassy - President and CEO
- David H. Clark - CEO Worldwide Consumer
- Brian T. Olsavsky - Senior VP and CFO
- Shelley L. Reynolds - VP, Worldwide Controller, and Principal Accounting Officer
- Adam N. Selipsky - CEO Amazon Web Services
- David A. Zapolsky - Senior VP, General Counsel, and Secretary

Source

1. Amazon-2021-Annual-Report... 2. Amazon-2021-Annual-Report... 3. Amazon-2021-Annual-Report... 4. Amazon-2022-Annual-Report... 5. Amazon-2022-Annual-Report...

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annualreports

Ask me anything...

NEW – Customize and deploy Foundation Models

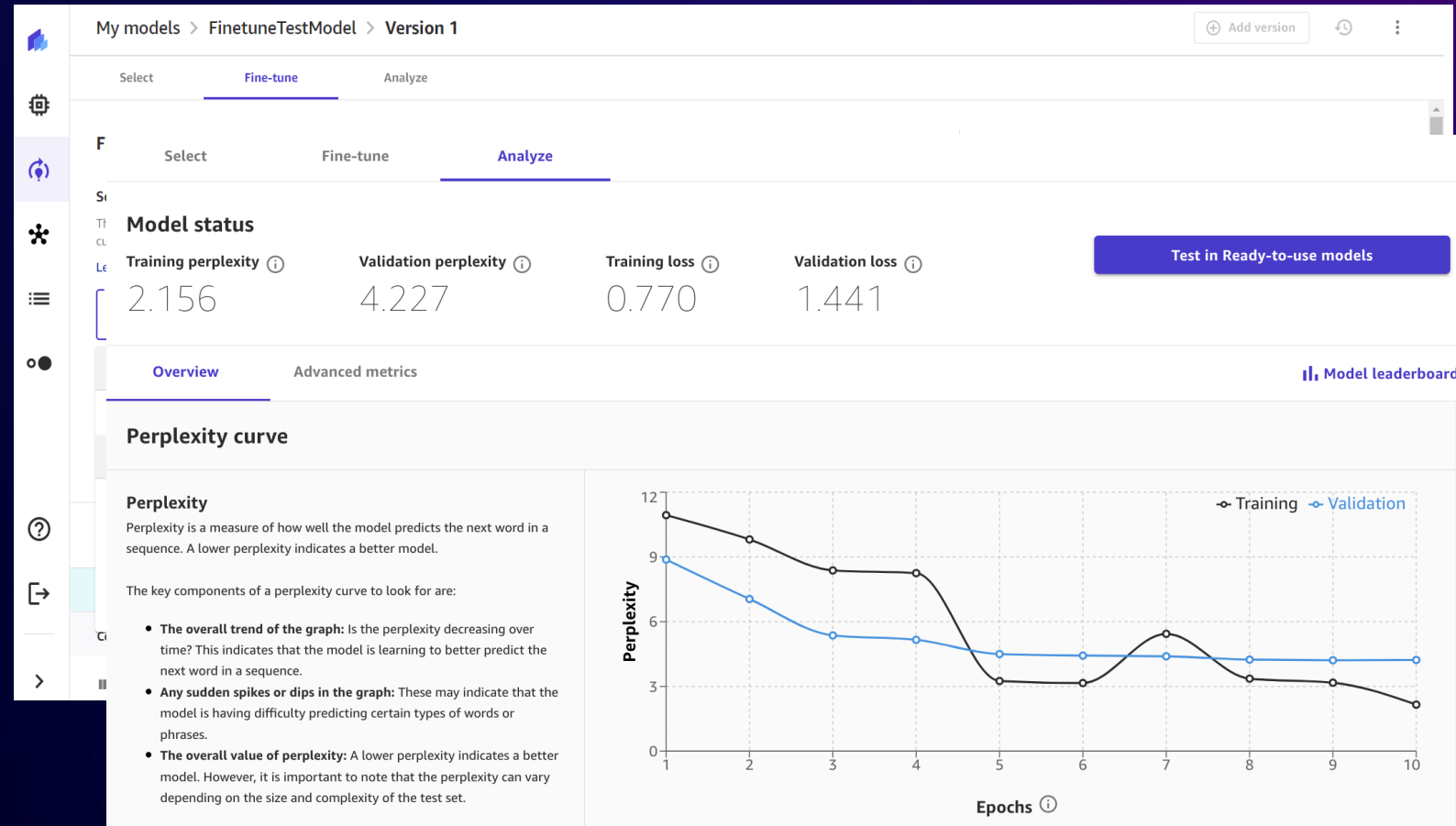
NEW – Customize and deploy Foundation Models

- Select the FMs to customize

The screenshot displays the AWS SageMaker console interface for configuring a fine-tuned model. The breadcrumb navigation at the top shows 'My models > FinetuneTestModel > Version 1'. The main content area is divided into three tabs: 'Select', 'Fine-tune' (which is active), and 'Analyze'. On the left sidebar, there are icons for various SageMaker features. The 'Fine-tune model configurations' section includes a 'Select up to 3 base models' instruction, a note about foundation models, and a link to learn more. Below this, a 'Select base models' dropdown menu is open, showing a list of models: 'Titan Express' (checked), 'Falcon-7B-Instruct' (checked), 'Falcon-40B-Instruct' (unchecked), and 'MPT-7B-Instruct' (unchecked). To the right of the model selection, there are two dropdown menus: 'Select input column' with 'input' selected, and 'Select output column' with 'output' selected. A 'Configure model' button is located below these dropdowns. On the far right, a large blue 'Fine-tune' button is visible. At the bottom of the console, a table header is partially visible with columns for 'Column name', 'Data type', 'Missing', and 'Unique'. A status bar at the very bottom indicates 'Total columns: 2', 'Total rows: 10,000', and 'Total cells: 20,000'.

NEW – Customize and deploy Foundation Models

- Select the FMs to customize
- Evaluate models



NEW – Customize and deploy Foundation Models

- Select the FMs to customize
- Evaluate models
- Model leaderboard

The screenshot shows the AWS SageMaker console interface for a fine-tuned model. The breadcrumb navigation at the top reads "My models > FinetuneTestModel > Version 1". The main tabs are "Select", "Fine-tune", and "Analyze", with "Analyze" being the active tab. On the left sidebar, the "Model status" section is expanded, showing "Training perplexity" as 2.156 and "Validation" as 4.22. Below this, the "Perplexity curve" section is visible, along with a "Perplexity" definition: "Perplexity is a measure of how well the model predicts a sequence. A lower perplexity indicates a better model." The "Model leaderboard" section is also visible, showing a table of model performance metrics.

Model name	Training perplexity	Validation perplexity	Training loss	Validation loss
{ Fine-tuned Titan Text Large }	0.14	0.15	0.03	0.15
{ Fine-tuned Jurassic 2 Ultra }	0.22	0.16	0.15	0.17
{ Fine-tuned MPT 40 }	0.25	0.17	0.17	0.18

NEW – Customize and deploy Foundation Models

- Select the FMs to customize
- Evaluate models
- Model leaderboard
- Deploy models

The screenshot shows the AWS SageMaker console interface for a fine-tuned model. The breadcrumb navigation at the top reads "My models > FinetuneTestModel > Version 1". The main tabs are "Select", "Fine-tune", and "Analyze", with "Analyze" being the active tab. On the left sidebar, the "Model status" section is expanded, showing "Training perplexity" as 2.156 and "Validation" as 4.22. Below this, the "Perplexity curve" section is visible, along with a "Perplexity" definition: "Perplexity is a measure of how well the model predicts a sequence. A lower perplexity indicates a better model." The "Model leaderboard" is also displayed, showing a table with columns for Model name, Training perplexity, Validation perplexity, Training loss, and Validation loss. The table lists three models: "{ Fine-tuned Titan Text Large }" (Default model), "{ Fine-tuned Jurassic 2 Ultra }", and "{ Fine-tuned MPT 40 }".

Model name	Training perplexity	Validation perplexity	Training loss	Validation loss
{ Fine-tuned Titan Text Large } (Default model)	0.14	0.15	0.03	0.15
{ Fine-tuned Jurassic 2 Ultra }	0.22	0.16	0.15	0.17
{ Fine-tuned MPT 40 }	0.25	0.17	0.17	0.18

Demo



NO-CODE FINE-TUNING OF LARGE LANGUAGE MODELS



Amazon Bedrock



SageMaker JumpStart

WITH AMAZON SAGEMAKER CANVAS

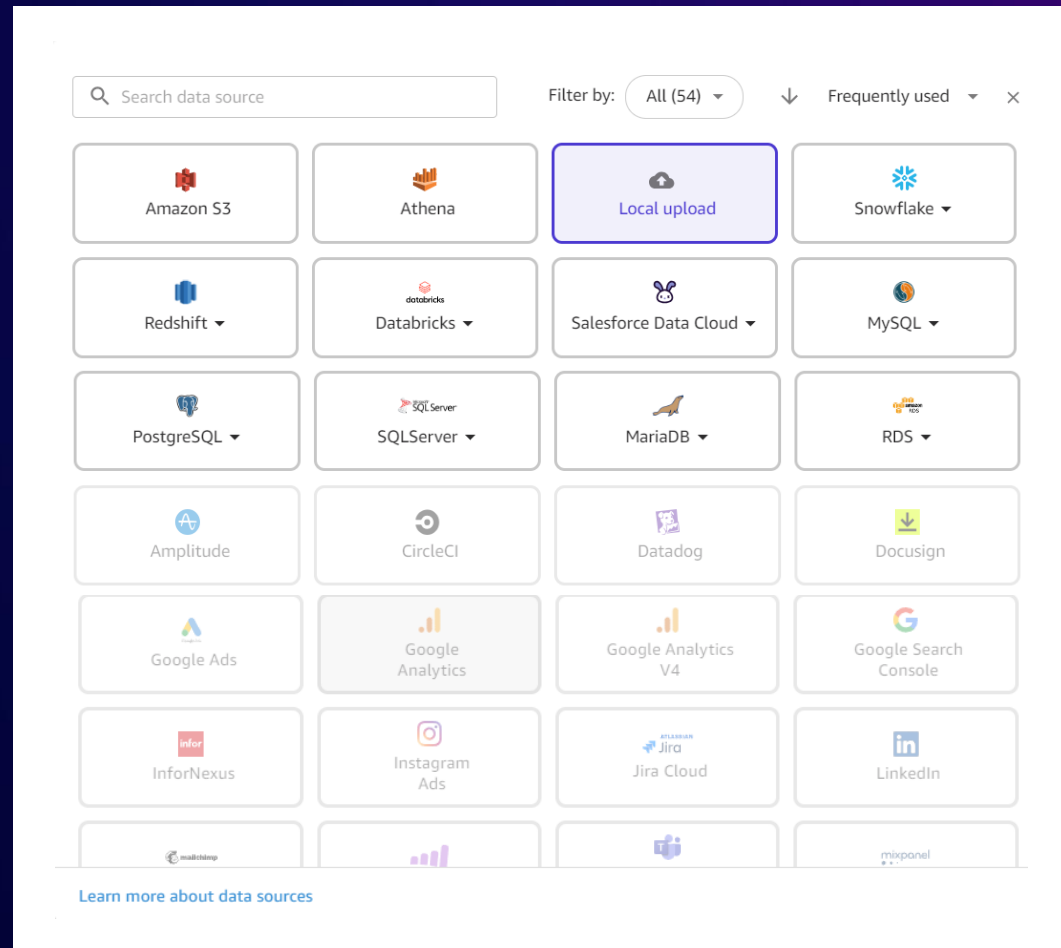
Custom Models - Comprehensive ML capabilities

Prepare data, build custom models, train and deploy models

Prepare Data

Prepare Data

- 50+ data connectors



Prepare Data

- 50+ data connectors
- Rich data insights powered by ML

The screenshot shows the AWS Data Wrangler interface for a data flow named 'House-loan.flow' with a dataset 'canvas-sample-loans-part-1.csv'. The report is titled 'Data quality and insights report: DQI-before' and was generated on November 20, 2023, at 3:17 PM PST. The report includes a summary of dataset statistics and a high priority warning about a very low quick-model score.

Data Wrangler: Data flow > House-loan.flow > canvas-sample-loans-part-1.csv

Data quality and insights report: DQI-before

Target column: loan_status, Type: Classification, Dataset: canvas-sample-loans-part-1.csv, Date: November 20, 2023 at 3:17 PM PST

Summary

Dataset statistics

Key (undefined)	Value (undefined)	
Number of features	24	
Number of rows	1000	
Missing	0.296%	
Valid	99.7%	
Duplicate rows	0%	

Feature type (undefined)	Count (undefined)	
numeric	13	
categorical	3	
text	3	
datetime	2	
binary	2	
unknown	0	

High Priority Warnings

1 high severity warnings were detected. See the list below.

Very low quick-model score High

The predictive quality of the quick model on the validation fold is lower than the quality of the trivial model. The trivial model predicts "the average" for regression and "the most common class" for classification. Either the features that you've provided aren't useful in predicting the target, or the automatic feature processing couldn't parse the data efficiently. For more information, see the summary of features section in the report. To make your model more accurate, we recommend cleaning your dataset and adding more predictive features.

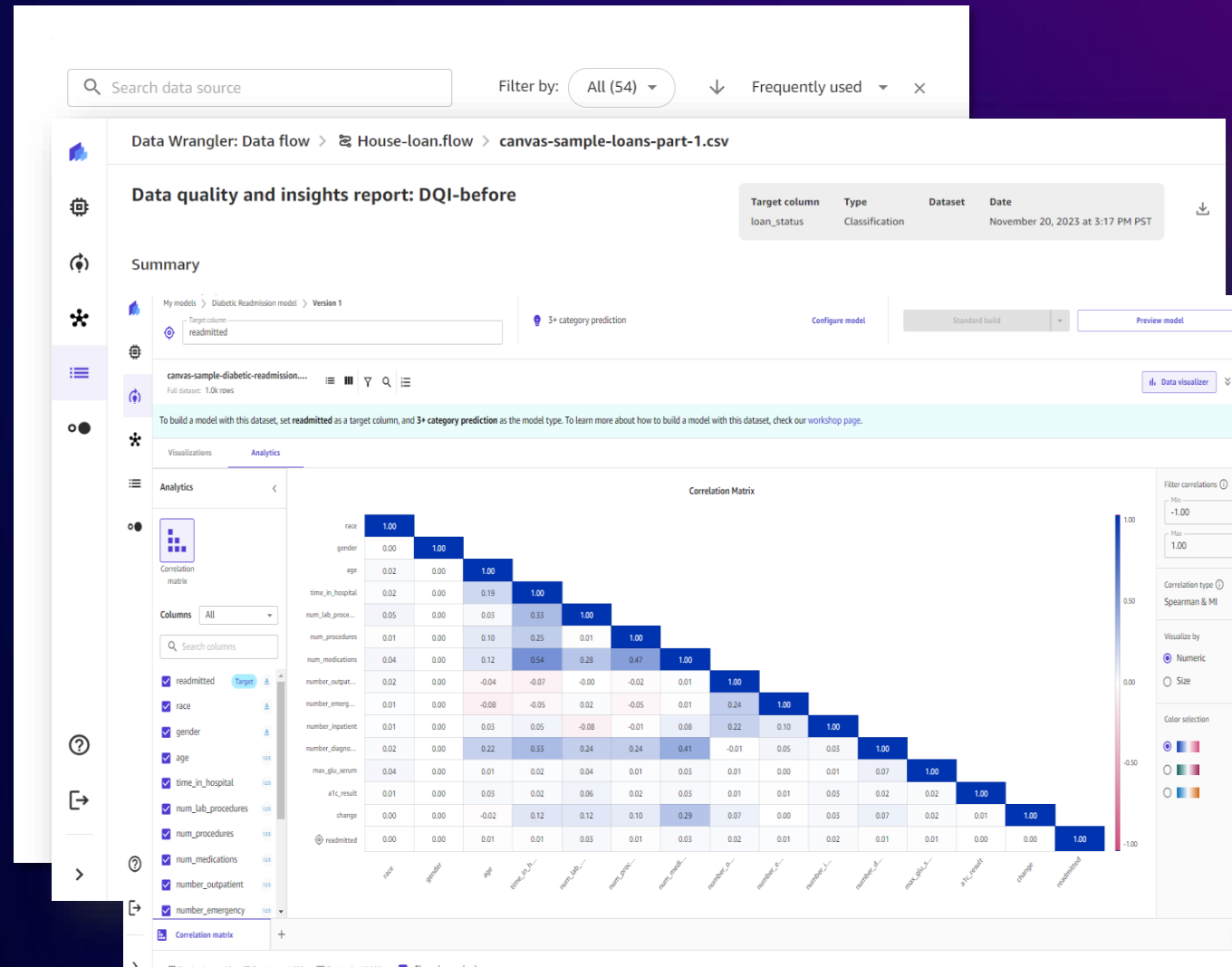
Duplicate rows

No duplicate rows were found in the 1000 rows tested.

Note: features of type vector are ignored in duplicate rows detection

Prepare Data

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



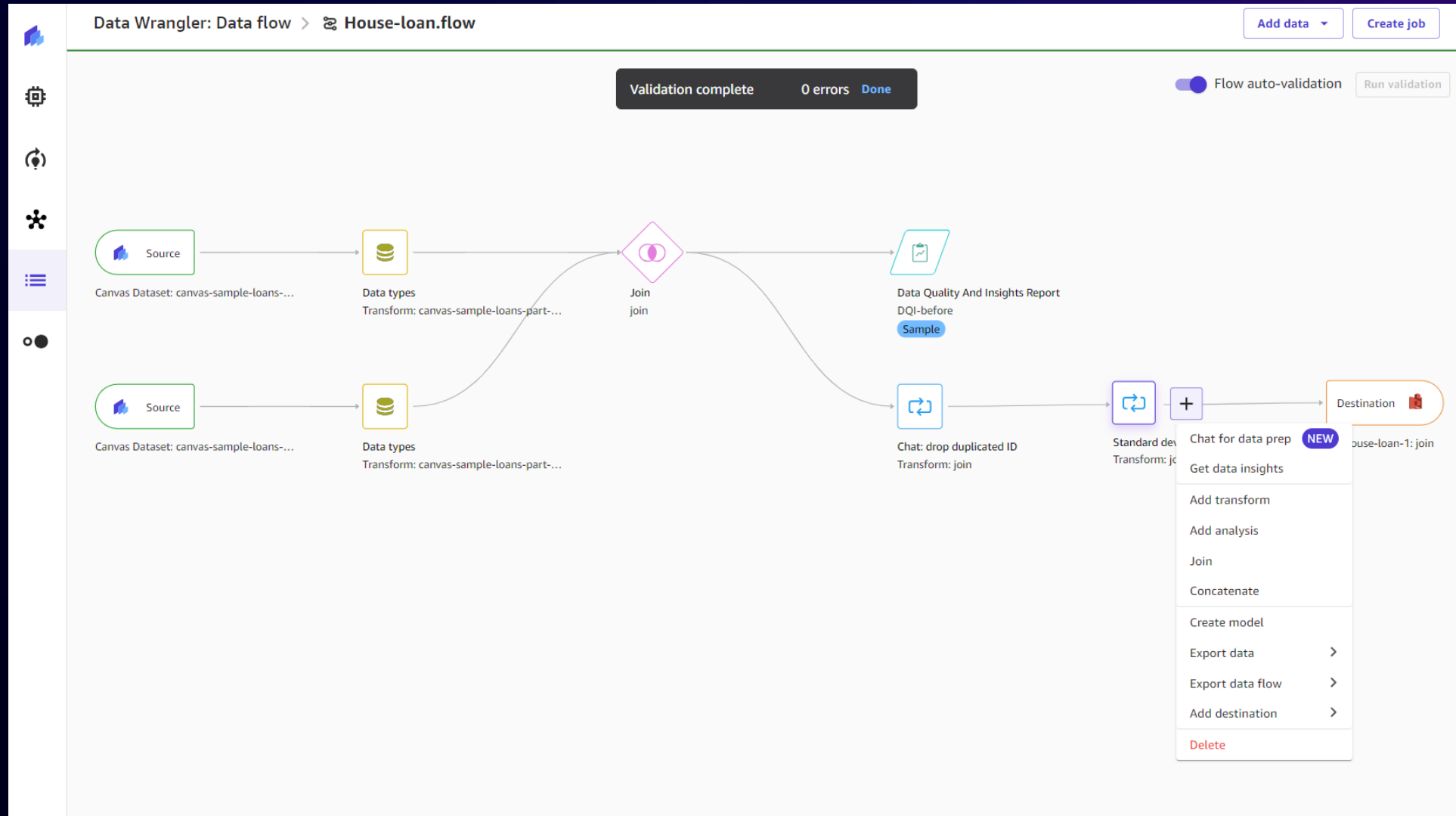
Prepare Data

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

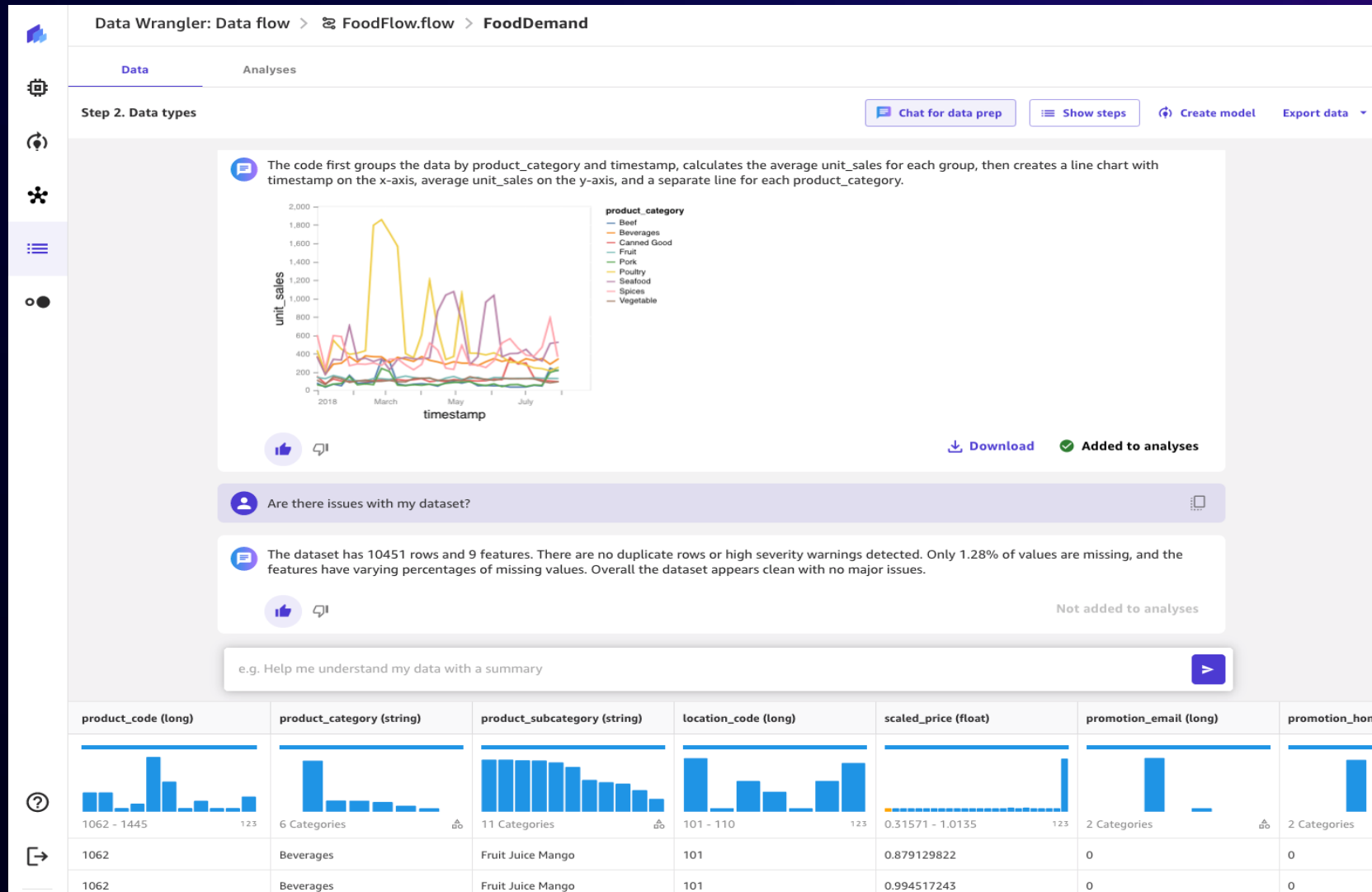
The screenshot displays the Amazon SageMaker Canvas interface, which is used for preparing data and building machine learning models. The interface is divided into several sections:

- Data Wrangler: Data flow**: Shows the current data source as `canvas-sample-loans-part-1.csv`.
- Data quality and insights report: DQI-before**: A report showing the target column (`loan_status`), type (`Classification`), dataset, and date (November 20, 2023 at 3:17 PM PST).
- Summary**: A section for building a model, showing the target column (`readmitted`) and the model type (`3+ category prediction`).
- My models / Lab 1 - Churn / Version 2**: A section for building a model, showing the target column (`Churn`) and the model type (`2 category prediction`).
- ChurnData**: A table showing the full dataset (5.0k rows) with columns: `Vmail_Plan`, `Vmail_Me...`, `State`, `Phone`, and `Night_Mi`. The table includes visualizations for each column and a `View all` button.
- Add transform**: A section for adding transforms to the data flow, including options like `Manage columns`, `Change data type`, `Custom formula`, `Replace missing values`, `Replace outlier values`, `Manage rows`, `Drop duplicate rows`, and `Drop rows by formula`.

NEW – Data Preparation Flow



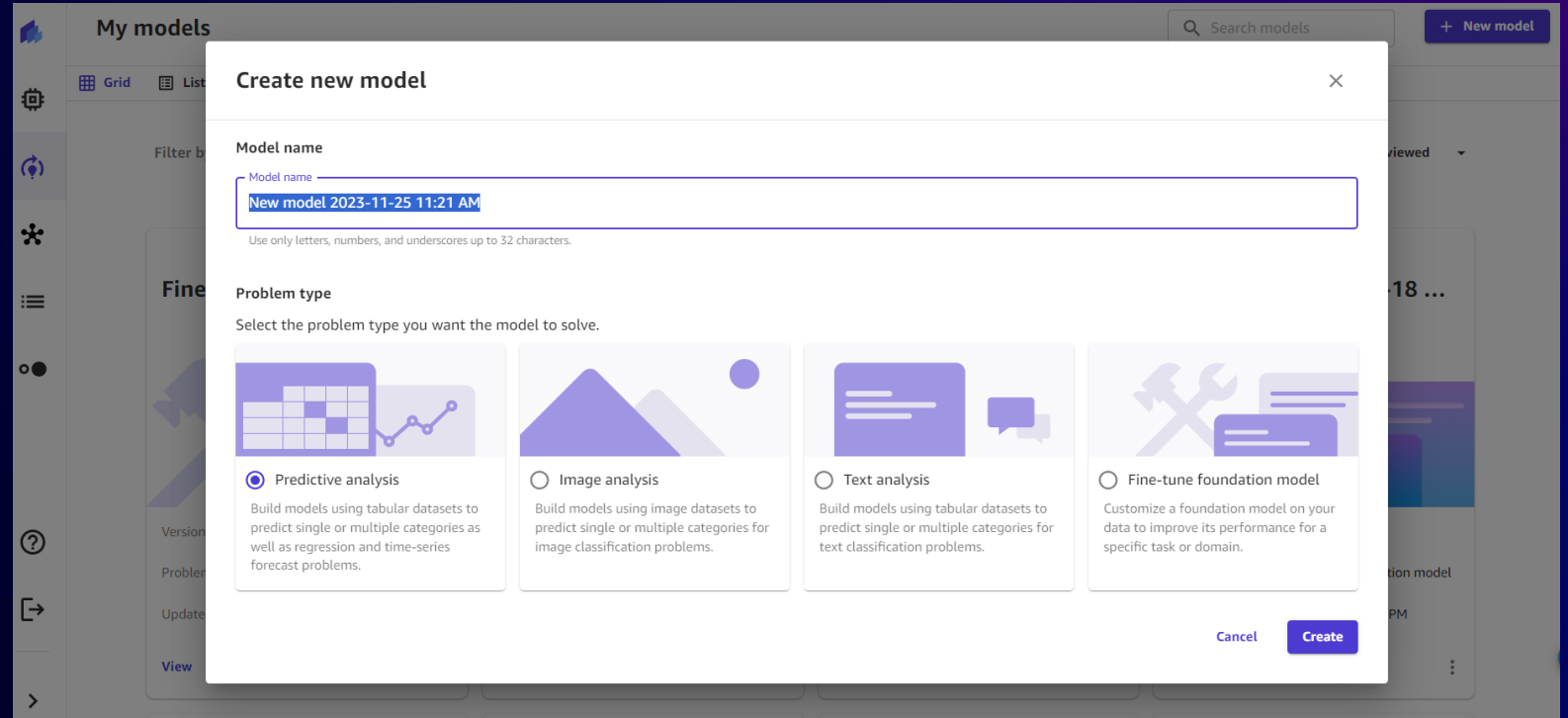
NEW – Data prep using natural language



Build and evaluate custom models

Build and evaluate custom models

- Choose model type



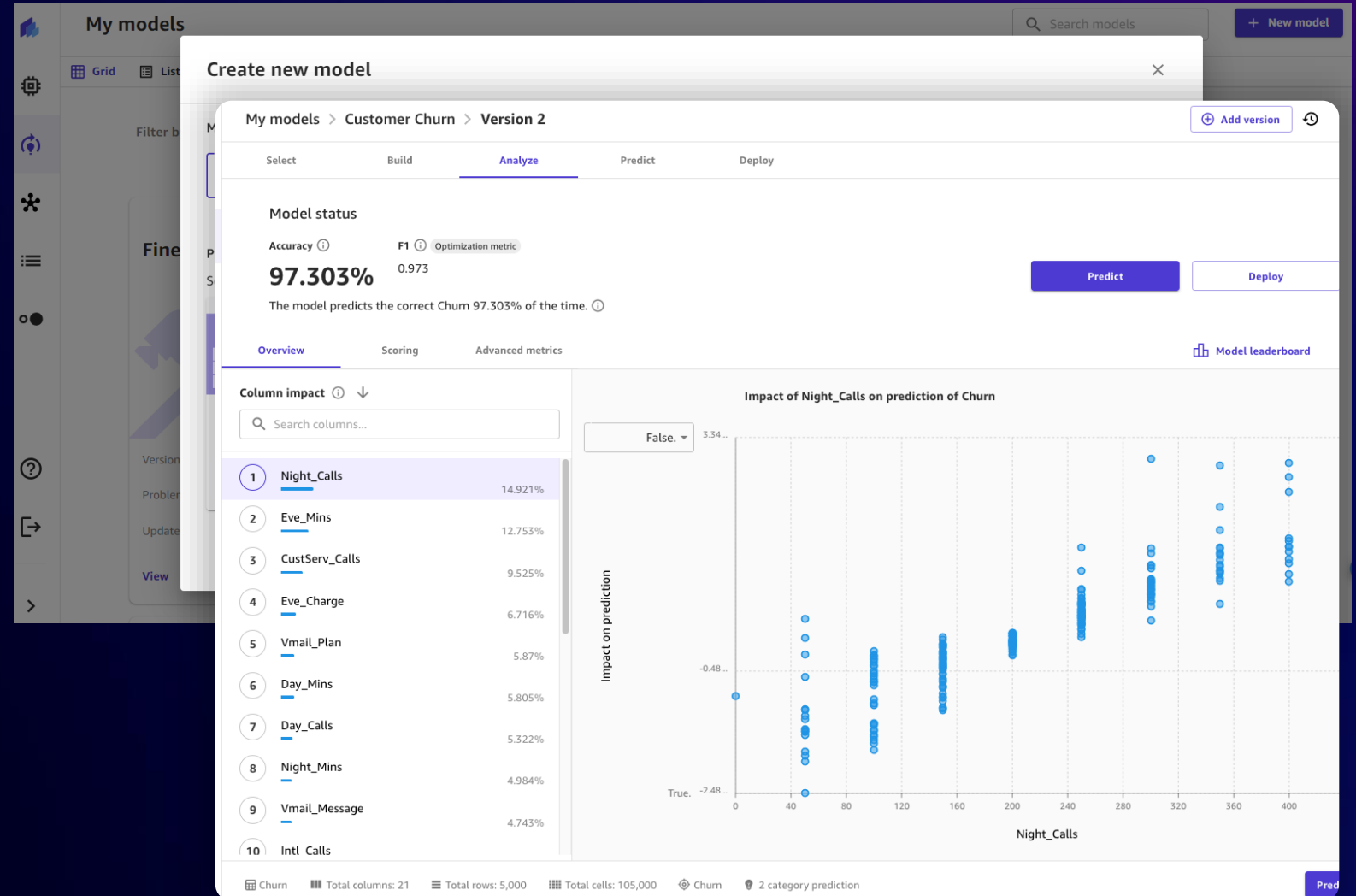
The screenshot shows the 'Create new model' dialog box in the AWS SageMaker console. The dialog is titled 'Create new model' and has a close button (X) in the top right corner. It contains the following sections:

- Model name:** A text input field with the value 'New model 2023-11-25 11:21 AM'. Below the field is a note: 'Use only letters, numbers, and underscores up to 32 characters.'
- Problem type:** A section titled 'Select the problem type you want the model to solve.' with four options:
 - Predictive analysis:** Selected with a radio button. Description: 'Build models using tabular datasets to predict single or multiple categories as well as regression and time-series forecast problems.'
 - Image analysis:** Unselected. Description: 'Build models using image datasets to predict single or multiple categories for image classification problems.'
 - Text analysis:** Unselected. Description: 'Build models using tabular datasets to predict single or multiple categories for text classification problems.'
 - Fine-tune foundation model:** Unselected. Description: 'Customize a foundation model on your data to improve its performance for a specific task or domain.'

At the bottom right of the dialog are 'Cancel' and 'Create' buttons.

Build and evaluate custom models

- Choose model type
- Analyze model metrics



Build and evaluate custom models

- Choose model type
- Analyze model metrics
- Model leaderboard

The screenshot displays the AWS SageMaker console interface. In the background, the 'My models' page is visible. Overlaid on this is the 'Create new model' dialog, which shows the 'Analyze' tab for a model named 'Customer Churn > Version 2'. The model's status is 'Ready', and its accuracy is 97.303%. The dialog also shows the 'Model leaderboard' table, which lists various models and their performance metrics.

Create new model

My models > Customer Churn > Version 2

Model status

Accuracy 97.303% F1 0.973 Optimization metric

The model predicts the correct Churn 97.303% of the time.

Model leaderboard

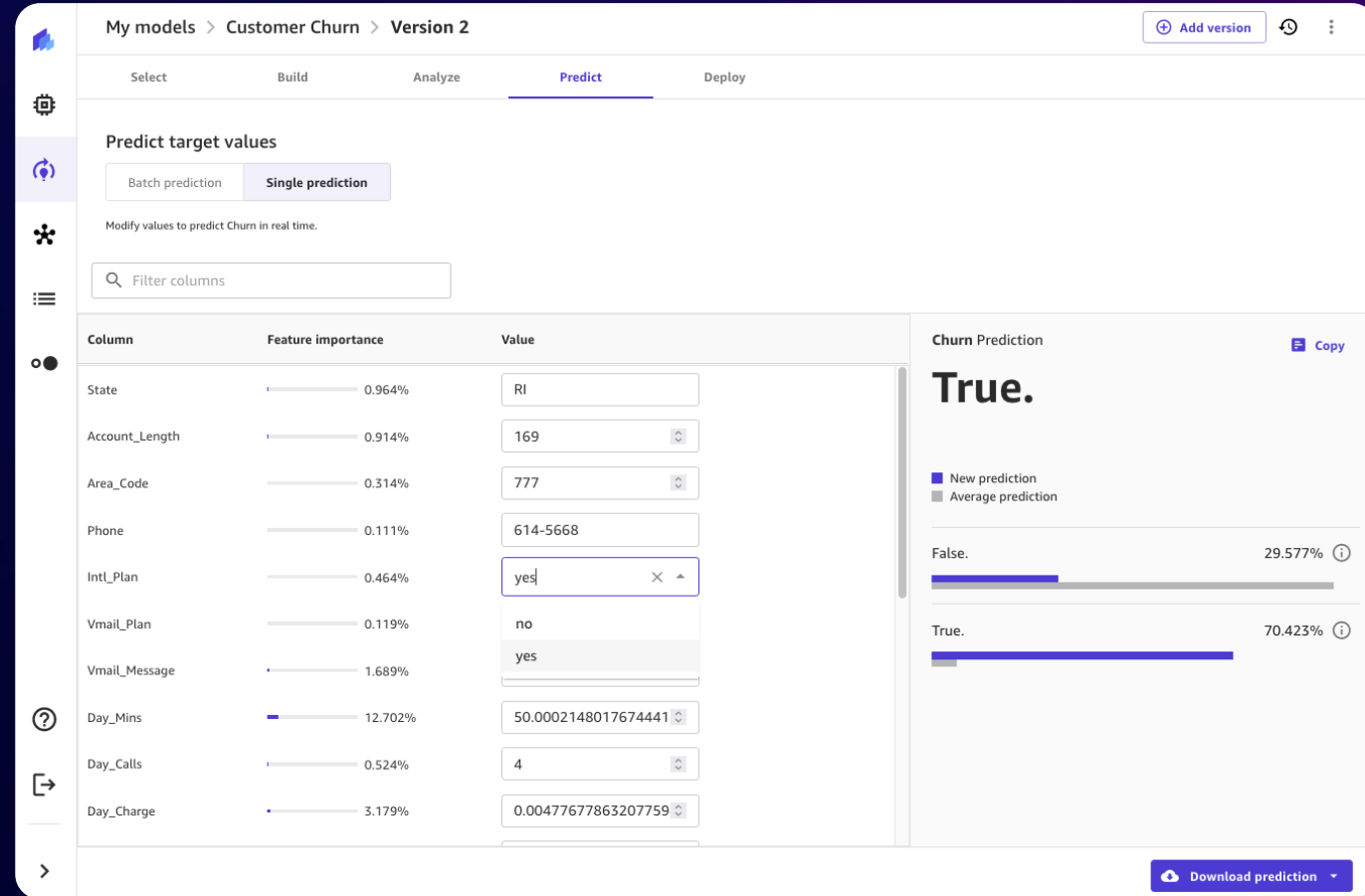
	Model name	F1 Optimization	Accuracy	AUC	Balanced Accuracy	Precision	Recall	Log Loss	Inference latency (s)
1	Night_Calls								
2	Eve_Mins	WeightedEnsemble-L3-FULL-t1	97.303%	0.991	97.303%	97.206%	97.400%	0.200	0.514
3	CustServ	WeightedEnsemble-L2-FULL-t9	91.929%	0.970	91.810%	90.504%	93.400%	0.251	0.222
4	Eve_Charg	WeightedEnsemble-L2-FULL-t8	97.114%	0.993	97.103%	96.634%	97.600%	0.102	0.119
5	Vmail_Plac	WeightedEnsemble-L2-FULL-t7	94.466%	0.986	94.407%	93.359%	95.600%	0.155	0.111
6	Day_Mins	WeightedEnsemble-L2-FULL-t6	94.466%	0.986	94.407%	93.359%	95.600%	0.155	0.107
7	Day_Calls	WeightedEnsemble-L2-FULL-t5	94.466%	0.986	94.407%	93.359%	95.600%	0.155	0.108
8	Night_Min	WeightedEnsemble-L2-FULL-t4	97.114%	0.993	97.103%	96.634%	97.600%	0.102	0.121
9	Vmail_Mes	WeightedEnsemble-L2-FULL-t3	97.114%	0.993	97.103%	96.634%	97.600%	0.102	0.121
10	Intl Calls	WeightedEnsemble-L2-FULL-t2	94.466%	0.986	94.407%	93.359%	95.600%	0.155	0.107
	Churn	WeightedEnsemble-L2-FULL-t10	97.114%	0.993	97.103%	96.634%	97.600%	0.102	0.118

Generate highly accurate predictions



Generate highly accurate predictions

- In-app predictions & what-if analysis



Generate highly accurate predictions

- In-app predictions & what-if analysis
- Automate predictions

My models > Customer Churn > Version 2

Select Build Analyze **Predict** Deploy

Predict target values

Batch prediction Single prediction

Modify values to predict Churn in real time.

Automate batch prediction

Select a dataset to generate predictions for. Every time the selected dataset is updated (either manually or automatically), a new automatic batch prediction job runs.

Prediction frequency

⌚ Immediate
Every time the selected dataset is updated.

Select a dataset to generate predictions on

Select dataset

Cancel Set up

Day_Charge 3.179% 0.00477677865207759

Churn Prediction Copy

True.

■ New prediction
■ Average prediction

False. 29.577% ⓘ

True. 70.423% ⓘ

Download prediction

Generate highly accurate predictions

- In-app predictions & what-if analysis
- Automate predictions
- One-click model deployment

The screenshot displays the AWS SageMaker console interface for a model named 'Customer Churn'. The top navigation bar shows 'My models > Customer Churn > Version 2'. The main content area is divided into tabs: 'Select', 'Build', 'Analyze', 'Predict' (active), and 'Deploy'. Under the 'Predict' tab, there are options for 'Batch prediction' and 'Single prediction'. A modal window titled 'Automate batch prediction' is open, explaining that a new automatic batch prediction job runs whenever the selected dataset is updated. Below this, a 'Churn Prediction' section shows a large 'True.' result, with a legend indicating 'New prediction' (blue) and 'Average prediction' (grey). A bar chart shows the distribution of predictions: 'False.' at 29.577% and 'True.' at 70.423%. A 'Download prediction' button is visible at the bottom right of this section.

Operations: Deployment / canvas-customer-churn-prediction-model

Deployment name	Status	Deployment type	Model
canvas-customer-churn-prediction-model	In service	Real-time	Churn Prediction

Created	Average predictions per day	Last prediction
10/21/23 09:10 AM	--	--

Instance type	Instance count	Inference response content	Input format
ml.m5.xlarge	1	predicted_label, probability, probabilities, labels	text/csv

Deployment URL: <https://runtime.sagemaker.us-east-1.amazonaws.com/endpoints/canvas-customer-churn-prediction-model/invocations>

View sample code

Generate highly accurate predictions

- In-app predictions & what-if analysis
- Automate predictions
- One-click model deployment
- Share predictions to Amazon QuickSight

The screenshot displays the AWS SageMaker console interface for a model named 'Customer Churn'. The top navigation bar shows 'My models > Customer Churn > Version 2'. The main content area is divided into tabs: 'Select', 'Build', 'Analyze', 'Predict', and 'Deploy'. The 'Predict' tab is active, showing options for 'Batch prediction' and 'Single prediction'. A modal window titled 'Automate batch prediction' is open, explaining that a new automatic batch prediction job runs whenever the dataset is updated. Below this, the 'Operations: Deployment / canvas-customer-churn-prediction-model' section is visible. It shows the deployment details for 'canvas-customer-churn-prediction-model', including its status ('In service'), deployment type ('Real-time'), and instance count ('1'). The 'Test deployment' tab is also visible, showing the deployment URL and a 'View sample code' link. On the right side, a 'Churn Prediction' result is shown, indicating a 'True' prediction with a 'Copy' button. Below this, a bar chart displays the distribution of predictions: 'False' at 29.577% and 'True' at 70.423%. A 'Download prediction' button is located at the bottom right.

My models > Customer Churn > Version 2

Select Build Analyze **Predict** Deploy

Predict target values

Batch prediction Single prediction

Modify values to predict Churn in real time.

Automate batch prediction

Select a dataset to generate predictions for. Every time the selected dataset is updated (either manually or automatically), a new automatic batch prediction job runs.

Prediction frequency

Operations: Deployment / canvas-customer-churn-prediction-model

Details Test deployment

Deployment name	canvas-customer-churn-prediction-model	Status	In service	Deployment type	Real-time	Model	Churn Prediction
Created	10/21/23 09:10 AM	Average predictions per day	--	Last prediction	--	Inference response content	predicted_label, probability, probabilities, labels
Instance type	ml.m5.xlarge	Instance count	1	Input format	text/csv		

Deployment URL [Learn how to invoke a real-time endpoint](https://runtime.sagemaker.us-east-1.amazonaws.com/endpoints/canvas-customer-churn-prediction-model/invocations)

<https://runtime.sagemaker.us-east-1.amazonaws.com/endpoints/canvas-customer-churn-prediction-model/invocations>

View sample code

Churn Prediction

True.

New prediction Average prediction

False. 29.577%

True. 70.423%

Download prediction

Collaborate with pro-code ML users

- Share model artifacts to SageMaker Studio
- Register model to SageMaker Model Registry

The screenshot displays the SageMaker Studio interface for a model named 'CustomerChurn'. The main view shows the model status as 'Ready' with a score of 96.903%. A 'Share Model' dialog is open, allowing the user to choose a model version to share (V1, Ready, Created Jan 30, 2023 8:44 PM) and select SageMaker Studio users (e.g., 'data scientist').

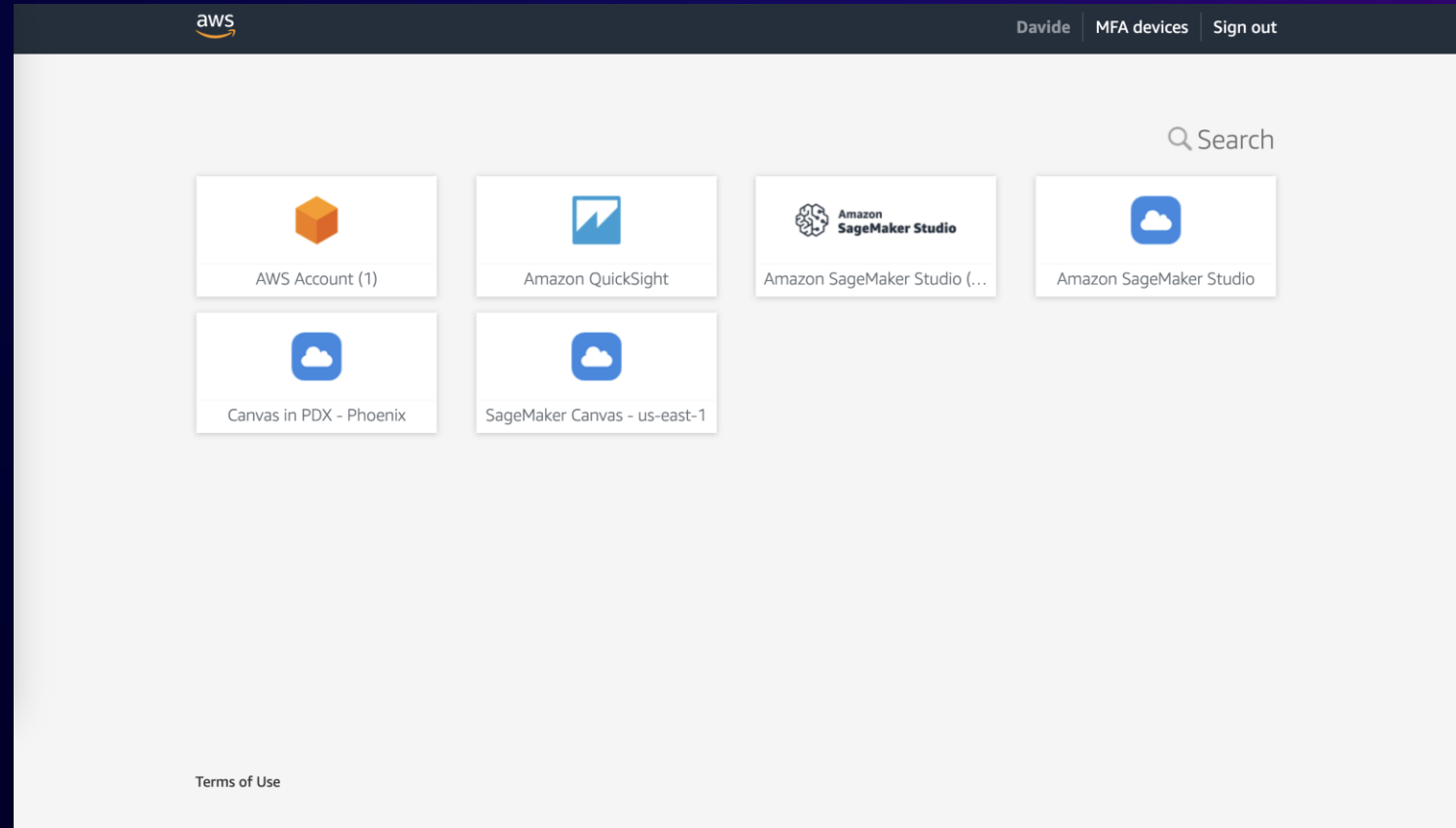
Below the dialog, the 'My models / Churn Prediction Model' page is visible. It shows a table of model versions (V1, V2, V3) with their status (Ready) and creation dates. A 'Model Registry details' pop-up is shown, detailing the model's registration status.

Version	Status	Created	Dataset
V3	Ready	04/25/2023 10:17 AM	churn.csv
V2	Ready	04/25/2023 10:16 AM	churn.csv
V1	Ready	04/25/2023 10:07 AM	churn.csv

Model score	Shared	Model Registry
Model Registry details		
Model package group name	canvas-Churn-Prediction-Model	Not Registered
Model Registry version	Version 1	Registered
Model Registry account ID	230852400868	Not Registered
Approval status	Pending approval	

Management controls

- Single sign-on setup



Management controls

- Single sign-on setup
- Setup permissions

The screenshot displays the Amazon SageMaker Admin console interface. At the top, the AWS logo is on the left, and the user's name 'Davide' with 'MFA devices' and 'Sign out' links is on the right. A search bar is located in the top right corner. The main navigation pane on the left includes sections for 'AWS Account', 'Canvas in PDX', and 'Amazon SageMaker'. The 'Amazon SageMaker' section is expanded, showing options like 'Getting Started', 'Admin', 'SageMaker dashboard', 'Governance', 'Ground Truth', 'Notebook', 'Processing', 'Training', 'Inference', 'Edge Manager', 'Augmented AI', 'AWS Marketplace', 'Tutorials', and 'Documentation'. The main content area shows the 'Configure ML activities' page, which is part of a multi-step process to create a new role. The current step is 'Step 2: Configure ML activities'. The page title is 'Configure ML activities', and the subtitle is 'Configure your role with the help of available ML activities.' The 'Configure new role' section includes a list of applications with their status: SageMaker Studio (Enabled), Canvas (Enabled), RStudio (Enabled), and VSCode (Enabled). Below this, a message states: 'Amazon SageMaker role manager recommends the selected ML activities based on the persona you chose in Step 1. Select the checkboxes below to remove or add additional ML activities.' The 'ML activities (15 activities selected)' section contains a table with the following activities:

	Name	Description
<input checked="" type="checkbox"/>	Run Studio applications	Permissions to operate within a Studio environment. Required f...
<input checked="" type="checkbox"/>	Manage ML jobs	Permissions to manage SageMaker jobs across their lifecycles.
<input checked="" type="checkbox"/>	Manage models	Permissions to manage SageMaker models and Model Registry.
<input type="checkbox"/>	Manage endpoints	Permissions to manage SageMaker Endpoint deployments and...
<input type="checkbox"/>	Manage pipelines	Permissions to manage SageMaker Pipelines and pipeline execu...
<input checked="" type="checkbox"/>	Manage experiments	Permissions to manage experiments and trials.

Management controls

- Single sign-on setup
- Setup permissions
- Automate shutdown

The screenshot displays the Amazon SageMaker Admin console interface. At the top, the AWS logo is on the left, and the user's name 'Davide' with 'MFA devices' and 'Sign out' links is on the right. A search bar is located in the top right corner. The main navigation pane on the left includes sections for 'AWS Account', 'Canvas in PDX', and 'Amazon SageMaker'. The 'Amazon SageMaker' section is expanded, showing a list of links: 'Getting Started' (Studio, Studio Lab, Canvas, RStudio), 'Admin' (Domains, Role manager, Intelligent defaults), 'SageMaker dashboard' (Images, Search), 'Governance' (Model dashboard, Model cards), 'Ground Truth', 'Notebook', 'Processing', 'Training', 'Inference', 'Edge Manager', 'Augmented AI', and 'AWS Marketplace'. At the bottom of this pane are 'Tutorials' and 'Documentation' links. The main content area shows the 'Create new role' process. It includes a breadcrumb trail: 'Amazon SageMaker > Admin console > Create new role'. The steps are: Step 1: Enter role information; Step 2: Configure ML activities (current step); Step 3: optional - Add additional policies and tags; Step 4: Review role. The 'Configure ML activities' section is titled 'Configure new role' and includes an 'Info' link. It lists applications with their status: SageMaker Studio (Enabled), Canvas (Enabled), RStudio (Enabled), and VSCode (Enabled). Below this, a message states: 'Amazon SageMaker role manager recommends the selected ML activities based on the persona you chose in Step 1. Select the checkboxes below to remove or add additional ML activities.' The 'ML activities (15 activities selected)' section contains a search bar and a table of activities. The table has columns for 'Name' and 'Description'. The activities listed are: 'Run Studio applications' (checked), 'Manage ML jobs' (checked), 'Manage models' (checked), 'Manage endpoints' (unchecked), 'Manage pipelines' (unchecked), and 'Manage experiments' (checked).

aws

Davide | MFA devices | Sign out

Search

Amazon SageMaker > Admin console > Create new role

Step 1
Enter role information

Step 2
Configure ML activities

Step 3 – optional
Add additional policies and tags

Step 4
Review role

Configure ML activities

Configure your role with the help of available ML activities.

Configure new role Info

Applications

SageMaker Studio [Learn more](#) ☒ SageMaker Studio Enabled

Canvas [Learn more](#) ☒ Canvas Enabled

RStudio [Learn more](#) ☒ RStudio Enabled

VSCode [Learn more](#) ☒ VSCode Enabled

Choose specific ML activities and enable customization of the activity settings.

Amazon SageMaker role manager recommends the selected ML activities based on the persona you chose in Step 1. Select the checkboxes below to remove or add additional ML activities.

ML activities (15 activities selected)

	Name	Description
<input checked="" type="checkbox"/>	Run Studio applications	Permissions to operate within a Studio environment. Required f...
<input checked="" type="checkbox"/>	Manage ML jobs	Permissions to manage SageMaker jobs across their lifecycles.
<input checked="" type="checkbox"/>	Manage models	Permissions to manage SageMaker models and Model Registry.
<input type="checkbox"/>	Manage endpoints	Permissions to manage SageMaker Endpoint deployments and...
<input type="checkbox"/>	Manage pipelines	Permissions to manage SageMaker Pipelines and pipeline execu...
<input checked="" type="checkbox"/>	Manage experiments	Permissions to manage experiments and trials.

Demo





Import data



Prepare data



Scale data operations



Build models

To get started...

Import data ▾

Select existing dataset ▾

Customer Story: Thomson Reuters

Ramdev Wudali

(he/him)

Data Architect AI & BI Platforms

Thomson Reuters



AI @ Thomson Reuters

WIN (Westlaw is Natural)

First commercially available search engine with probabilistic rank retrieval

PeopleCite & Profiler

To extract entities from American case law documents and create a knowledge base of judges, attorneys, and expert witnesses with links to all their cases and biographies

Reuters Insider

Reuters Insider used CaRE classification and Dexter entity extraction to connect transcripts of live news shows to video; this enabled searching video-based news

AI platform

Enabling both data scientists and non-programmers to rapidly build AI Solutions in production, prioritizing transparency, reusability and agility

Reuters Tracer and Social Data Platform (SDP)
Separating Real News from Fake in 40 Milliseconds

1990s

2000s

2010s

2020s

History Assistant

Large-scale natural language processing (NLP) system found history relationships between court decisions by using a combination of information retrieval and machine learning techniques to link each new case to related documents that it may impact

Checkpoint – Broadside

To power the new "Intuitive Search" capability in Checkpoint, TR's market-leading research solution for tax and accounting professionals

Casetext Acquisition

Supporting TR's 'build, partner and buy' strategy to bring generative AI solutions to its customers

CaRE - Classification and Recommendation Engine

To classify legal, tax and finance documents to large taxonomies

Practical Law Dynamic Search

State-of-the-art AI system designed to find the answers to free-form questions in Practical Law

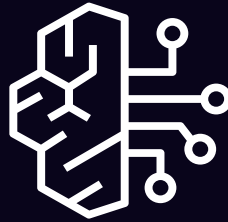
TR offers secure access and usage of AWS services

Low Code

No Code



Amazon SageMaker
Jumpstart



Amazon Bedrock



Amazon SageMaker
Canvas

AI Platform

Initially tailored to data scientists, now empowers AI novices

Services serving the AI Lifecycle end-to-end

Data Service

secures access to TR data

AI Annotation

captures annotations from subject-matter experts (SMEs)

AI Workspace

secures access to cloud resources

OpenArena

enables gen. AI solutions in a low code/no code space

Model Registry

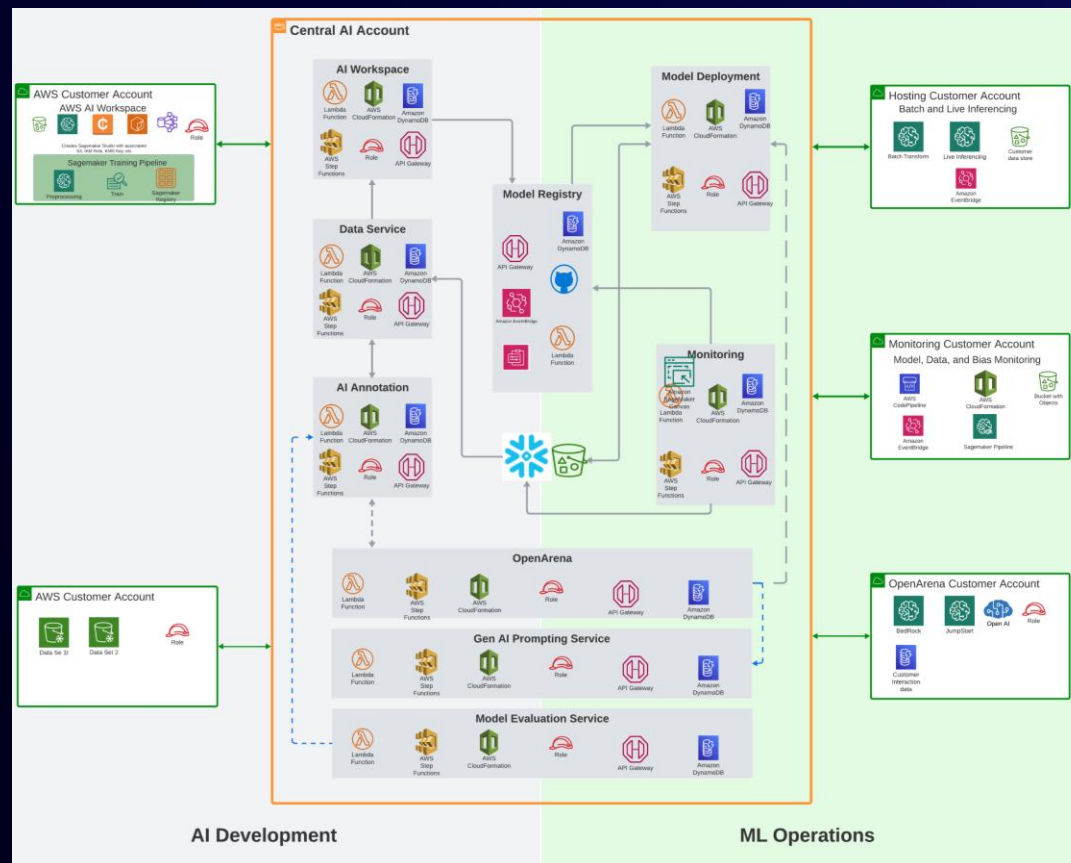
central repository of TR AI models

Model Deployment

streamlines model hosting

Monitoring

monitors model and data for quality, drift and bias



Secures access to **AWS** cloud resources and Thomson Reuters **content**

Enables **interactions** across accounts and **separation** between customer data and operational data

Enables **swift integration** of AI frameworks like generative AI

Encourages **reusability** of AI models

Facilitates **standardized governance** workflow

Currently evolving the AI Platform to empower low-code **generative AI chains**

Users can access AWS services and start building AI solutions through the AI Platform in a few clicks

Fill in a few fields to provision a **secure** compute **environment**

Add Workspace

Workspace Name: *

Testing Workspace

Project Name: *

Project Name

Description:

Description

DIA ID: * [Help](#)

DIA ID

Provider: *

AWS

Account ID:

664145726992 — TR EDL ADSS PROD

Data Classification: [Help](#)

Confidential

Asset ID:

208321

Region:

us-east-1

Owner Email:

sahar.elkhoury@thomsonreuters.com

Cancel

Save

REQUESTS

Outgoing Request

Requesting Workspace Name: abc

Requestor Email: test.qed@thomsonreuters.com

Requested On: 14 Apr 2023 03:01 PM GMT+2

Request Comments: Request access from DS

Dataset Name: AI Hackathon May 2023 - 3

Approver Email: test.qed@thomsonreuters.com

Dataset Description: [DS]

Status: ✓ Approved

Streamlines **access** to **data**

SERVICES

Service Owner Email

sahar.elkhoury@thomsonreuters.com

Service Type

All

Status

All

SAHAR.ELKHOURY@THOMSONREUTERS.COM

canvas-qEDE

Instance Type: canvas

Status: ✓ Ready

studio-NqRo

Instance Type: studio

Status: ✓ Stopped

Streamlines access to AWS Low Code/No Code ML **services** such as Amazon Bedrock, SageMaker Canvas

USERS

Ramdev Wudali

eSSO_0102180

Role: Approver

Sahar El Khoury

eSSO_6119620

Role: User

Facilitates **collaboration** across users



Enabling AI Novices through hackathons, sprints and workshops

200+
AI Novices
developed solutions
in less than 2days



Customer Calls Forecasting

to manage resources during peak seasons (time-series)



Conversion Prediction

to predict the likelihood of purchasing a subscription after a trial (binary classification)



Customer Profiling

to uncover customers' activity insights and patterns (clustering)

Enabling AI Novices through hackathons, sprints and workshops

Participating personas



Domain Experts



Data Scientists/
Researchers



Data Analysts



MLOps Engineers

...how they felt about their Canvas experience

"from **zero knowledge on AI**, to solve a use case??? Wow!!"

"it was amazing to learn about the day-to-day activities of an ML engineer working in TR starting off with workspaces and then playing around with **SageMaker Canvas** as a **data enthusiast** who had lost some touch with his data powers"

"H. who was **new** to the team had never worked on the **AI Platform**. After the hackathon, he started leveraging the AI platform for all his work"

"This was an amazing opportunity to **grab a big bite on AI in just 2 days!!** Our team from a wide **variety of background**, like **Dev, DevOps, Quality Assurance**, we brainstormed to understand the use case. End of Day1, we could figure out what we need to do to achieve from the available data and how the **SageMaker Canvas** and Data Wrangler could be used in building a solution for the problem..."

A deeper look at one of our use cases:

Business Problem:

Manage customer call resources during peak seasons to ensure optimal number of customer service personnel.

Challenge with current approach:

Human predictions do not provide a cost-effective solution.



Storage Engineer
Business Analyst
Software Engineer

Bringing their workflow to life with Canvas

Data Preparation

Historical data analysis from call center containing call volume, wait time, date and other relevant metrics Data Source: **Snowflake**

Feature Engineering

Use **Canvas**, to extract relevant features from the data and identify patterns/trends that impact call volume

Model Training

Canvas was used to train the custom model using the features identified

Deployment

Model artifact from the associated **S3** bucket was used to deploy a **SageMaker** inference endpoint

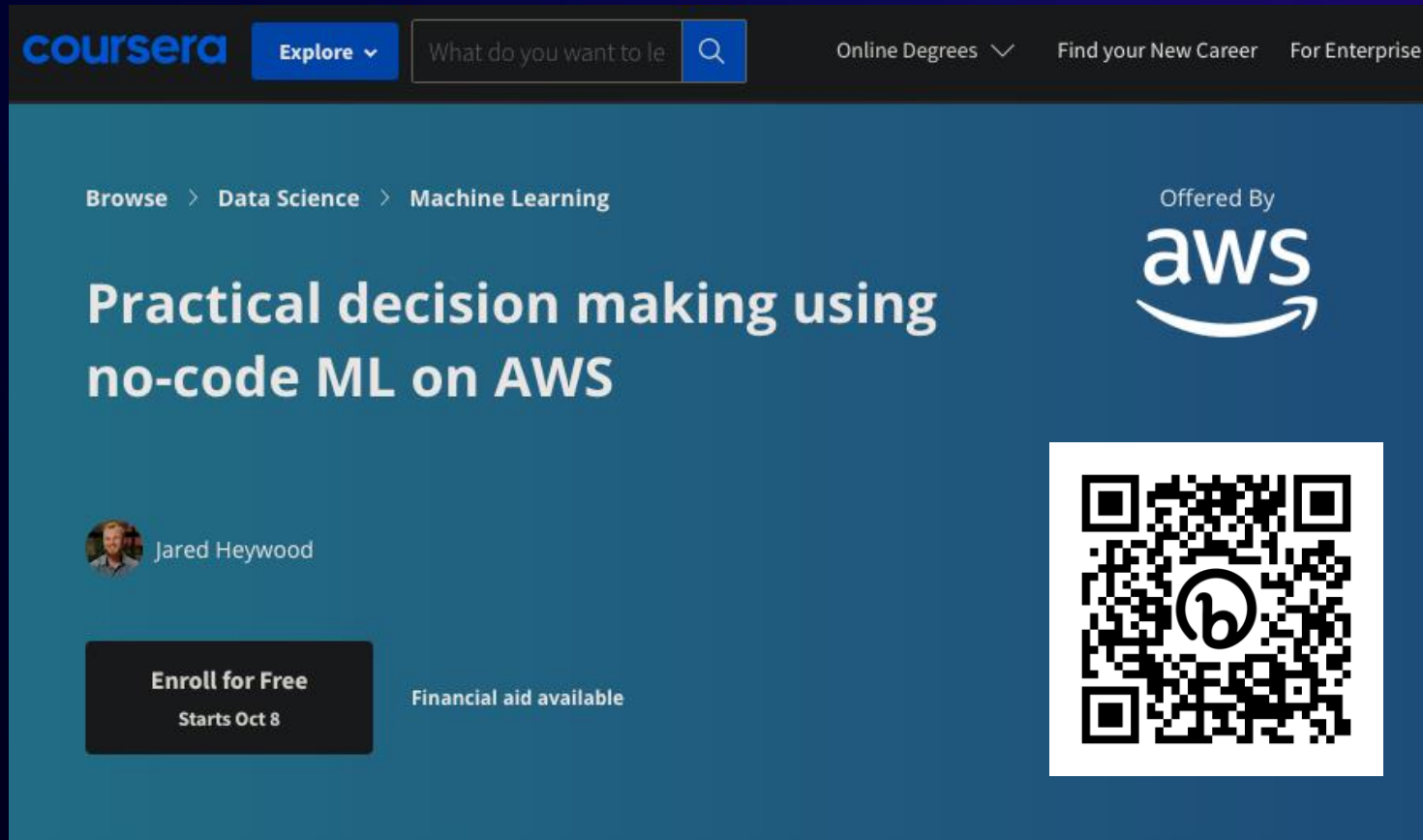
Key Learning Outcomes from using Canvas

- 1 Learned about the solutions AWS provides for AI problems
- 2 Learned to implement a Machine Learning model
- 3 Understood how to process and treat the data
- 4 Learn how simple it can be to train a Machine Learning model
- 5 Machine Learning proved to be novice friendly

Resources and Next Steps



Course for business users—how to ask ML questions



The screenshot shows the Coursera website interface. At the top, the Coursera logo is on the left, followed by an 'Explore' button with a dropdown arrow. A search bar contains the text 'What do you want to le' with a magnifying glass icon. To the right of the search bar are links for 'Online Degrees', 'Find your New Career', and 'For Enterprise'. Below the navigation bar, a breadcrumb trail reads 'Browse > Data Science > Machine Learning'. The main heading for the course is 'Practical decision making using no-code ML on AWS'. To the right of the heading is the 'Offered By aws' logo. Below the heading, there is a profile picture of Jared Heywood and his name. A dark blue button with white text says 'Enroll for Free' and 'Starts Oct 8'. To the right of the button, it says 'Financial aid available'. On the far right, there is a QR code with a Coursera logo in the center.

Enroll for Free
Starts Oct 8

Financial aid available

[More about the course \(Blog\)](https://www.coursera.org/learn/no-code-ml-aws)

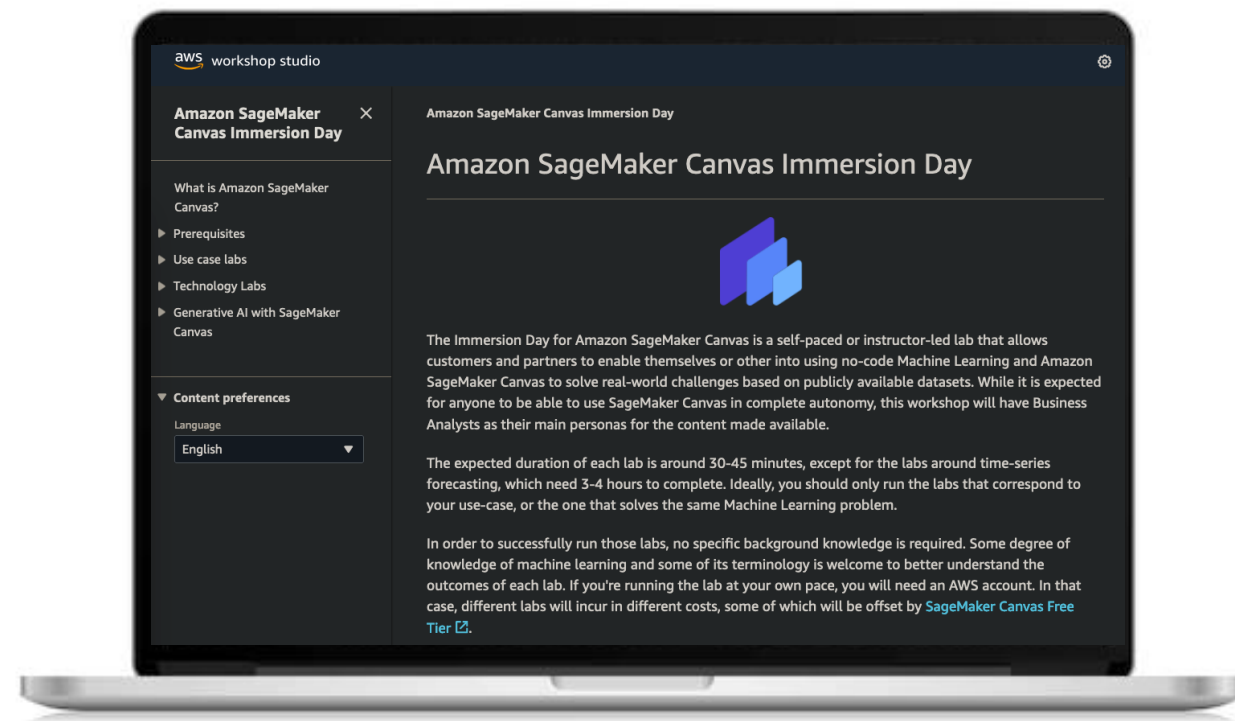
<https://www.coursera.org/learn/no-code-ml-aws>



Get hands-on today!



<https://bit.ly/sm-canvas-immday>



Low-Code/No-Code ML at re:Invent 2023

- **AIM339** | No-code ML and foundation models with Amazon SageMaker Canvas
 - Nov. 30 | 2:30 PM - 3:30 PM (PST)
 - Caesars Forum | Level 1 | Forum 115
- **AIM363** | New LLM capabilities in Amazon SageMaker Canvas
 - Nov 30 | 4:00 PM – 5:00 PM (PST)
 - Mandalay Bay | Level 2 | South | Oceanside C

Thank you!



Please complete the session survey in the mobile app

Rajneesh Singh

rajneesh@amazon.com



Davide Gallitelli

dggallit@amazon.com



Ramdev Wudali

ramdev.wudali@thomsonreuters.com

