

# AWS User Group Venezia

Giovedì 30 Gennaio

in presenza e in streaming

alle ore 19:00

AI & ML on AWS



#ComputerVision

Rosilari Bellacosa  
CTO  
@ SynDiag



#Forecasting

Alessandra Bilardi  
Data & Automation Specialist  
@ Corley Cloud



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## Promotori di AWS User Group Venezia #4



# Iniziative - biglietti conferenze



# Iniziative - estrazioni

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## Agenda

**Speech**  
**Iniziative**  
**Prossimo incontro**  
**Spritz**



# Speech





# Forecasting in AWS

Alessandra Bilardi - Data & Automation Specialist @ Corley Cloud

@AWSUserGroupVenezia #6 #Meetup #AWS

# Alessandra Bilardi

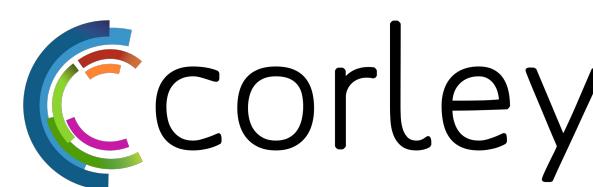
Data & Automation Specialist @ Corley Cloud

- Coderdojo Mentor
- PyData Venice Evangelist
- AWS User Group Venezia Evangelist

✉ alessandra.bilardi@corley.it

🐦 @abilardi

linkedin bilardi



## Agenda

**Keywords**

**AWS Services**

**Solution**

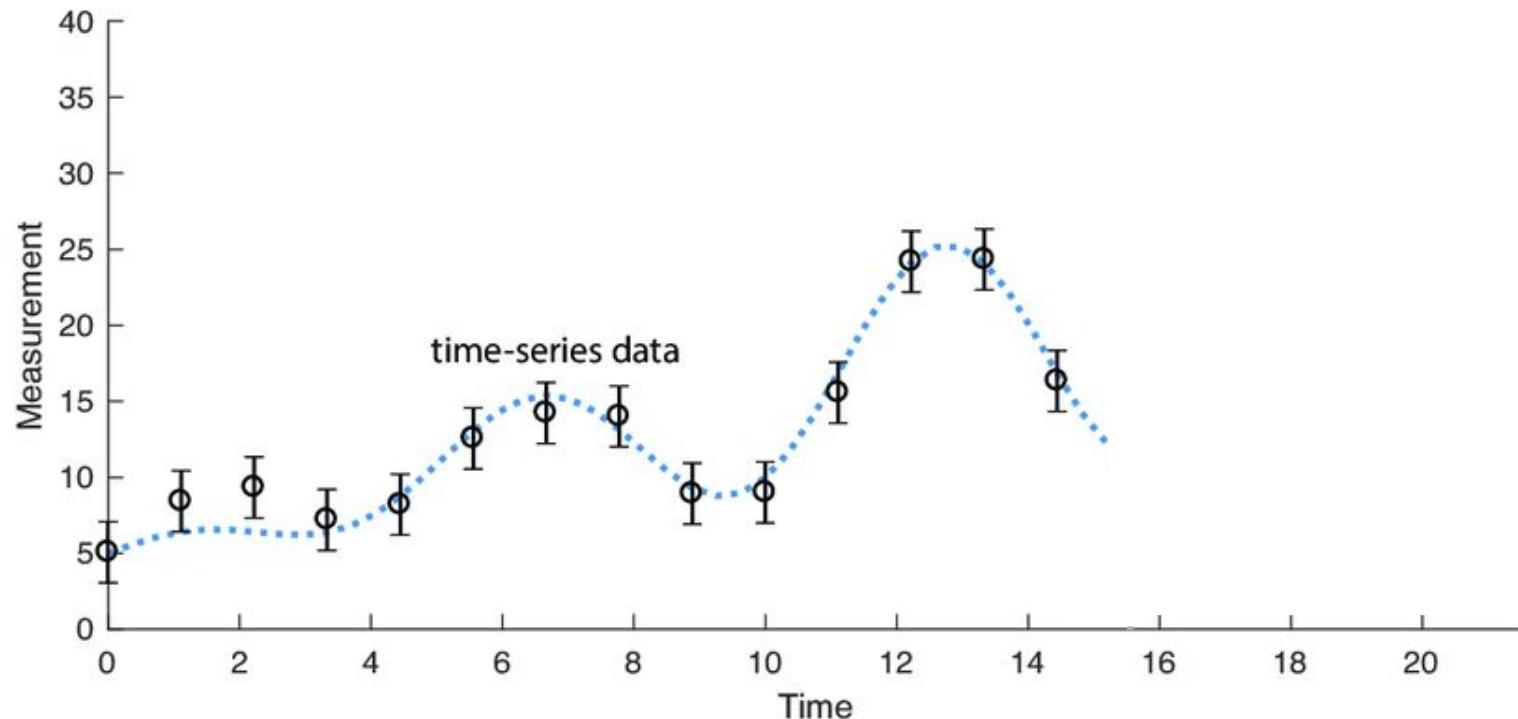
**Comparison**

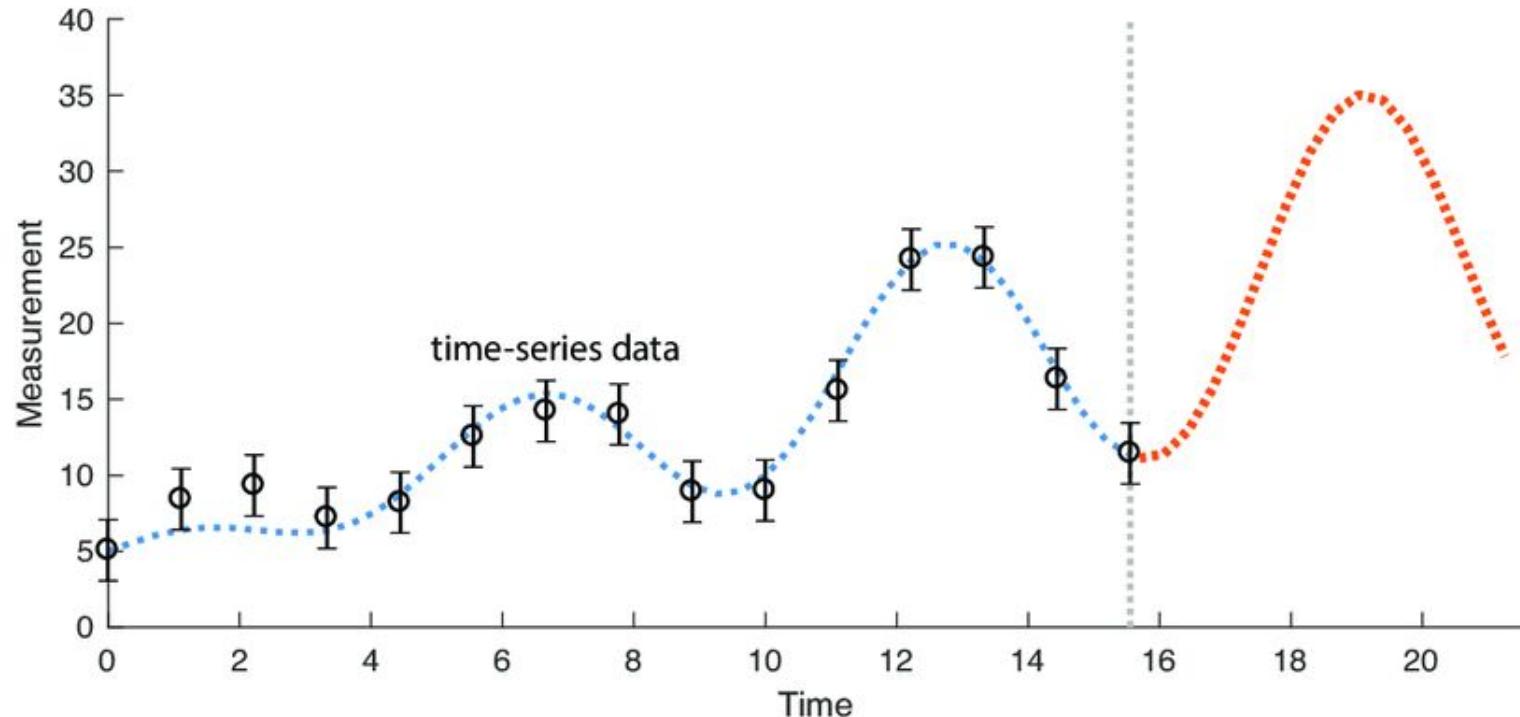
**Take Away**

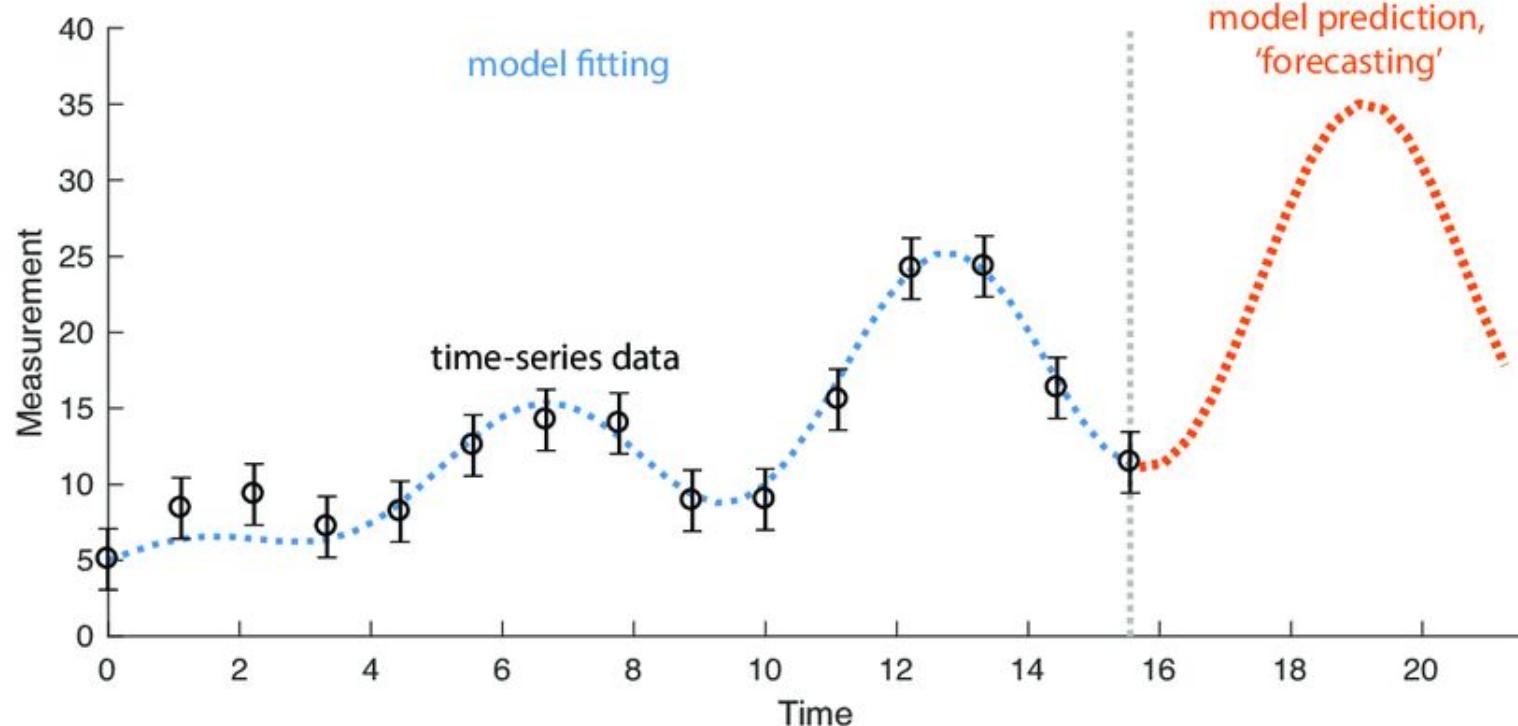


# Keywords









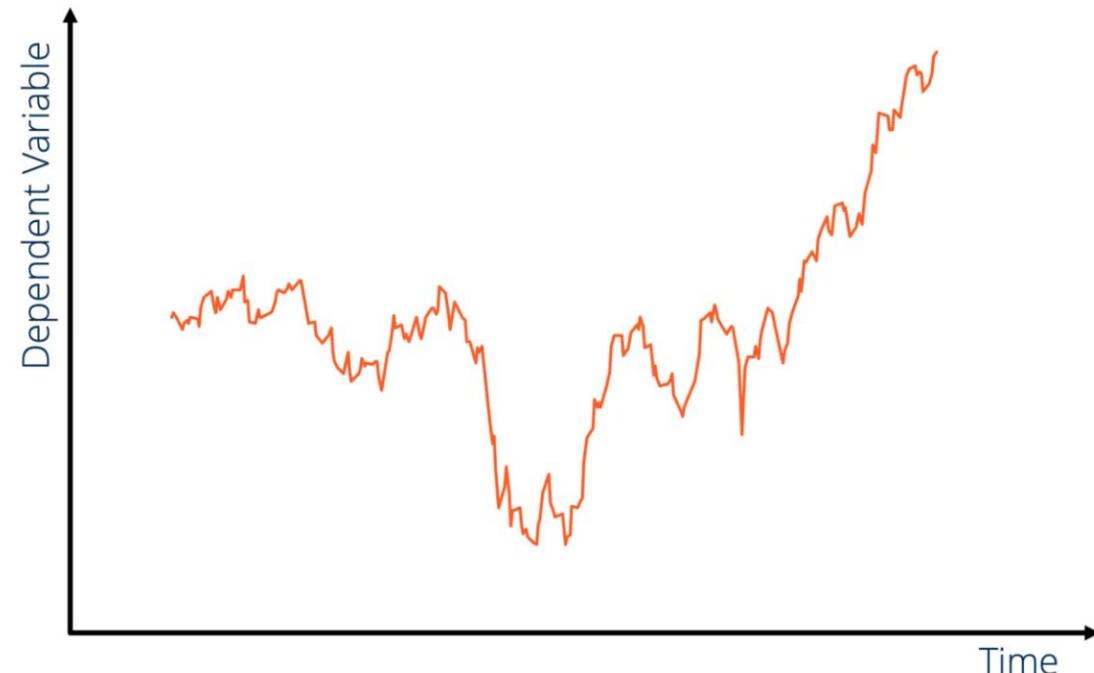
# The importance of the forecasting



- 1 retail demand planning
- 3 resource planning
- 2 supply chain planning
- 4 operational planning

# Time Series data

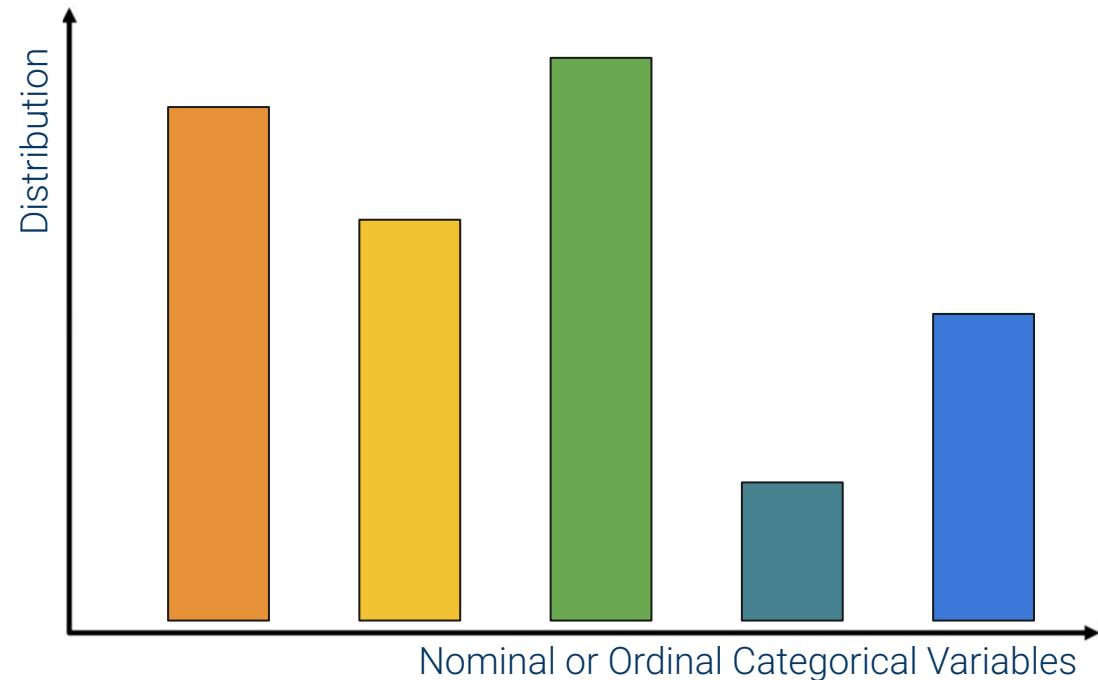
- Target Time Series (TTS)
  - *timestamp*
  - *item\_id* (identifier, SKU)
  - [ other dimension ]
  - *target\_value* (value)
  - [ Holidays, Weather ]
- Related Time Series (RTS)
  - *timestamp*
  - *item\_id* (identifier, SKU)
  - [ other dimension ]
  - *holiday* (with value 0 or 1)
  - *value* [ Weather, Stock, .. ]



# Categorical data



- Item metadata
  - *item\_id* (identifier, SKU)
  - *category* (string or number)
  - [ up to 10 columns total ]
- Geolocalization
  - distribution by
    - item
    - item / customer
  - what can we start from ?
    - ZIP
    - Country [ Holiday ]
    - longitude [ Weather ]
    - latitude [ Weather ]



# Which data can we use to do forecasting ?



- 1 target timeseries (TTS)
- 2 related timeseries (RTS)
- 3 categorical data (IM)
- 4 geolocalization (GEO)



## Example



reference

- target timeseries (TTS)
- related timeseries (RTS)
- categorical data (IM)
- geolocalization (GEO)



## Example



reference

- target timeseries (TTS)
- related timeseries (RTS)
- categorical data (IM)
- geolocalization (GEO)



## Example



reference

- target timeseries (TTS)
- related timeseries (RTS)
- categorical data (IM)
- geolocalization (GEO)



## Example



reference

- target timeseries (TTS)
- related timeseries (RTS)
- **categorical data (IM)**
- geolocalization (GEO)

# AWS Services



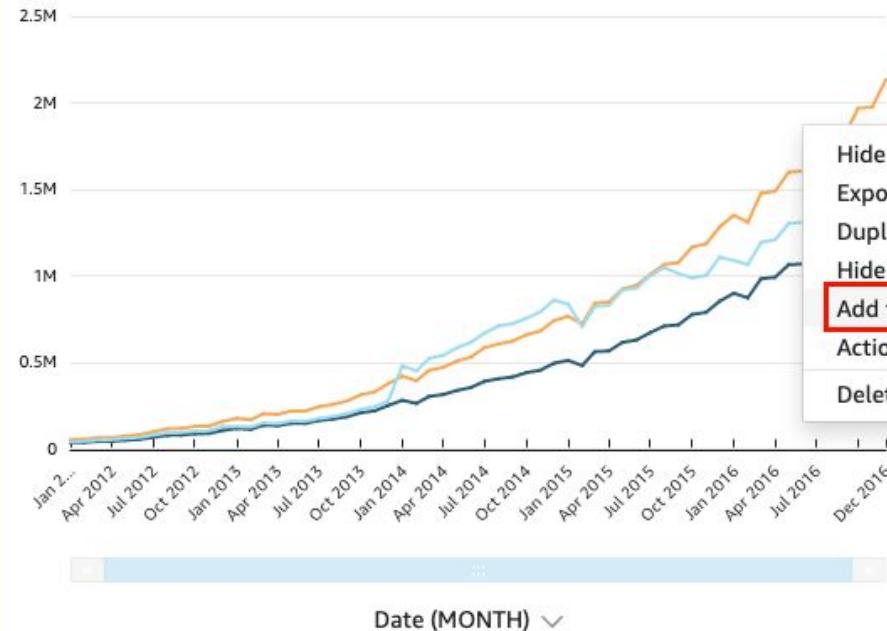
AWS

# User Groups



Amazon QuickSight

Sum of Cost, Sum of Billed Amount, and Sum of Revenue Goal by Date



Legend

- Revenue G
- Cost

- Hide legend
- Export to CSV
- Duplicate visual
- Hide "other" categories
- Add forecast** (highlighted with a red box)
- Actions
- Delete

reference

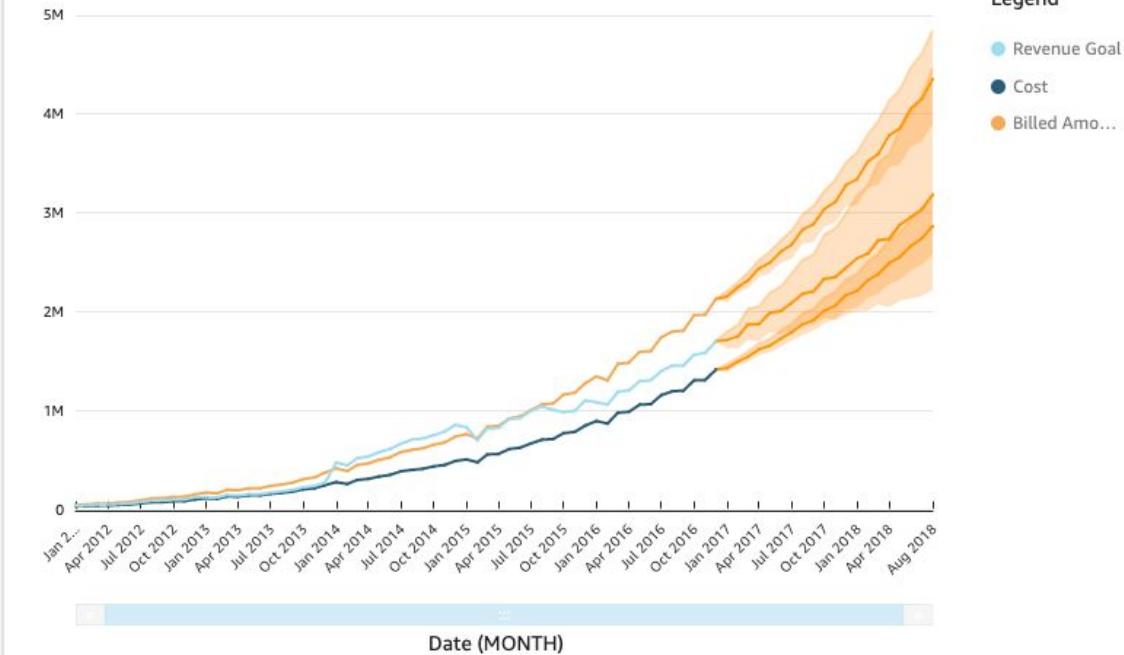
AWS

# User Groups



Amazon QuickSight

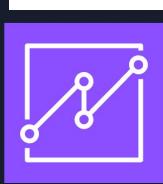
Sum of Cost, Sum of Billed Amount, and Sum of Revenue Goal by Date



reference

AWS

# User Groups



Amazon QuickSight



SageMakers

Amazon SageMaker  
Canvas



## Customer Churn Model

Ready Last edited Today at 11:48am



Add

Train

Evaluate

Predict

### Predict target values

#### 1. Review

Current dataset forecast range: 09/01/2021 - 09/15/2021

SageMaker Canvas makes predictions on the data at the end of your dataset.  
If you have more recent data, you can retrain the model on a newer dataset.

[Change dataset](#)

#### 2. Choose the prediction type

All items

Single item

This generates a prediction for all items in your dataset.

#### Forecasted values

Start Predictions

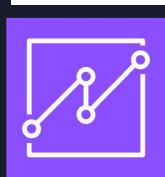


Close

reference

AWS

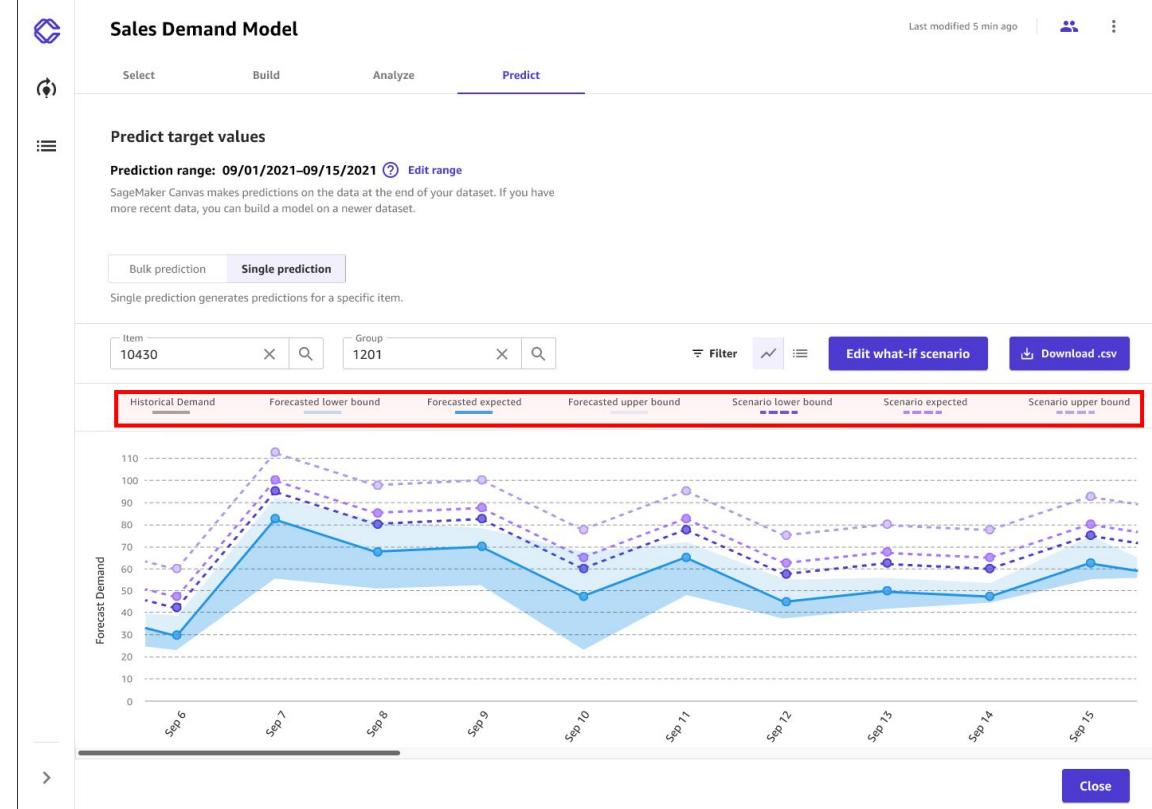
# User Groups



Amazon QuickSight

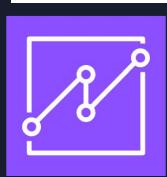


Amazon SageMaker  
Canvas



AWS

# User Groups



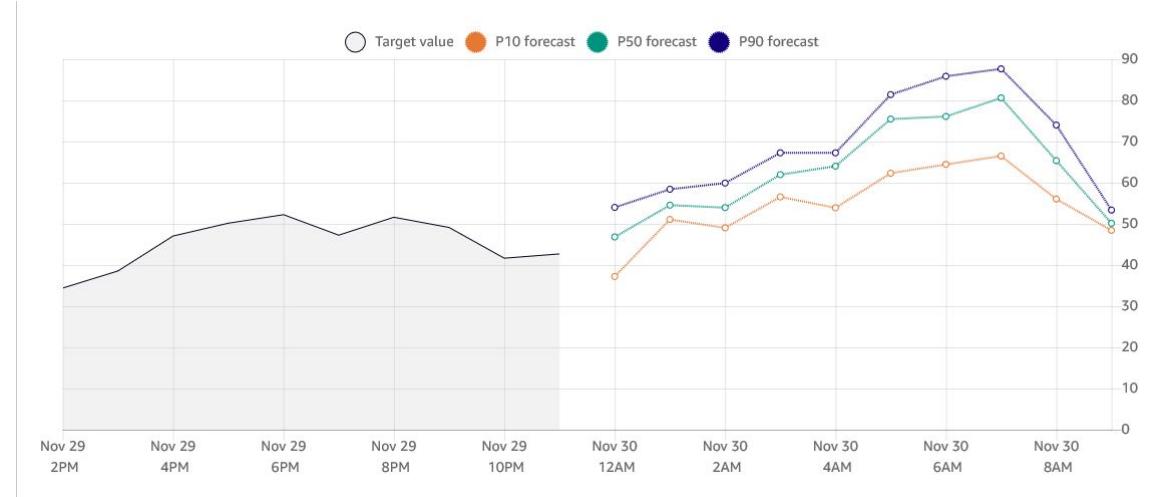
Amazon QuickSight



Amazon SageMaker Canvas



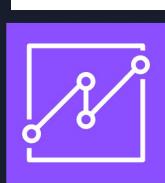
Amazon Forecast



reference

AWS

# User Groups



Amazon QuickSight



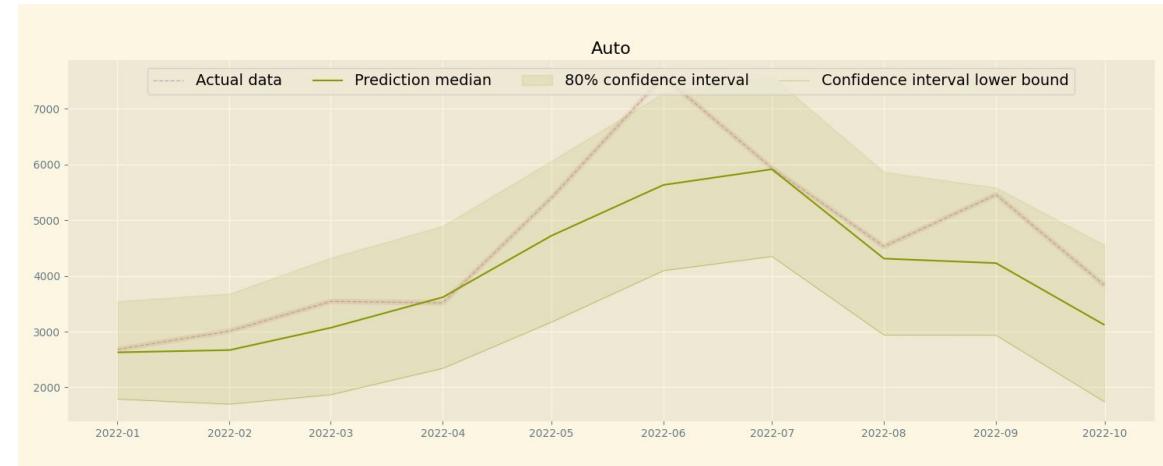
Amazon SageMaker  
Canvas



Amazon Forecast

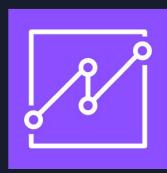


Amazon SageMaker



AWS

# User Groups



Amazon QuickSight



Amazon SageMaker  
Canvas



Amazon Forecast



Amazon SageMaker

AWS

# User Groups



Amazon QuickSight



Amazon SageMaker  
Canvas



Amazon Forecast



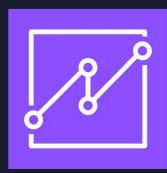
Amazon SageMaker



Business

AWS

# User Groups



Amazon QuickSight



Amazon SageMaker  
Canvas



Amazon Forecast



Amazon SageMaker



Business



Operator

AWS

# User Groups



Amazon QuickSight



Amazon SageMaker  
Canvas



Amazon Forecast



Amazon SageMaker



Business



Operator



Data Scientist

AWS

# User Groups



Evaluation



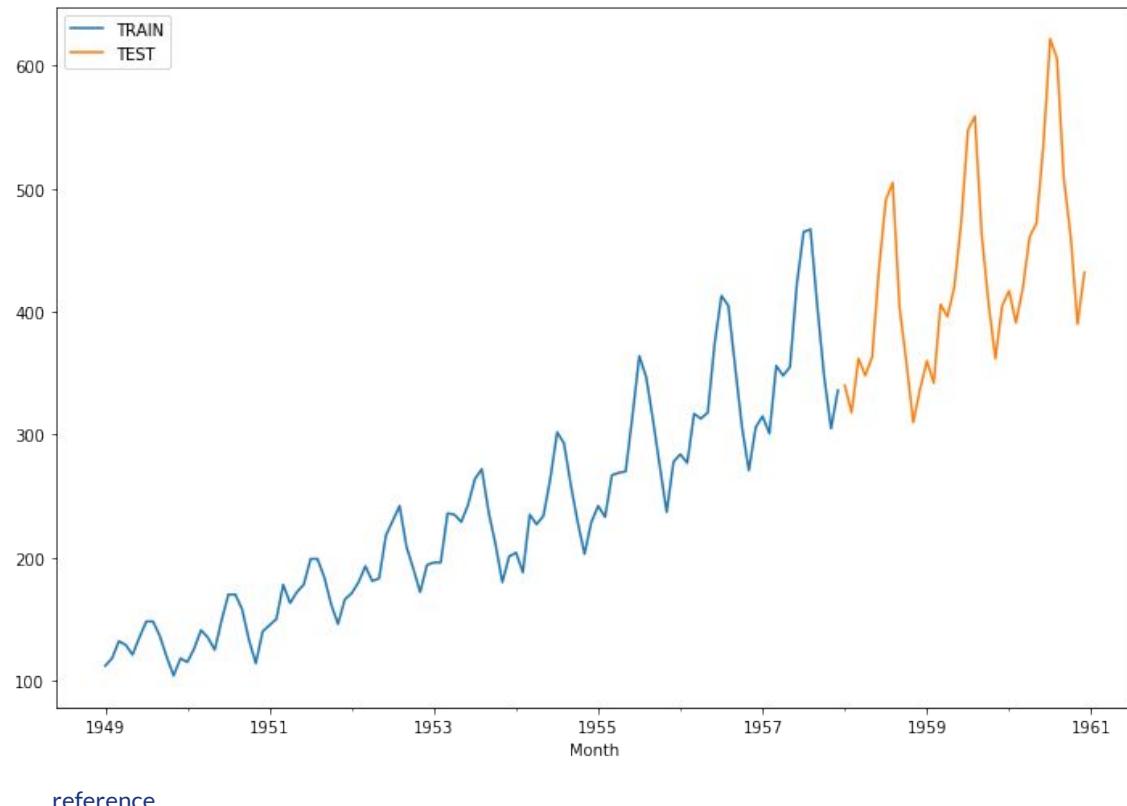
Amazon SageMaker  
Canvas



Amazon Forecast



Amazon SageMaker



AWS

# User Groups



Evaluation



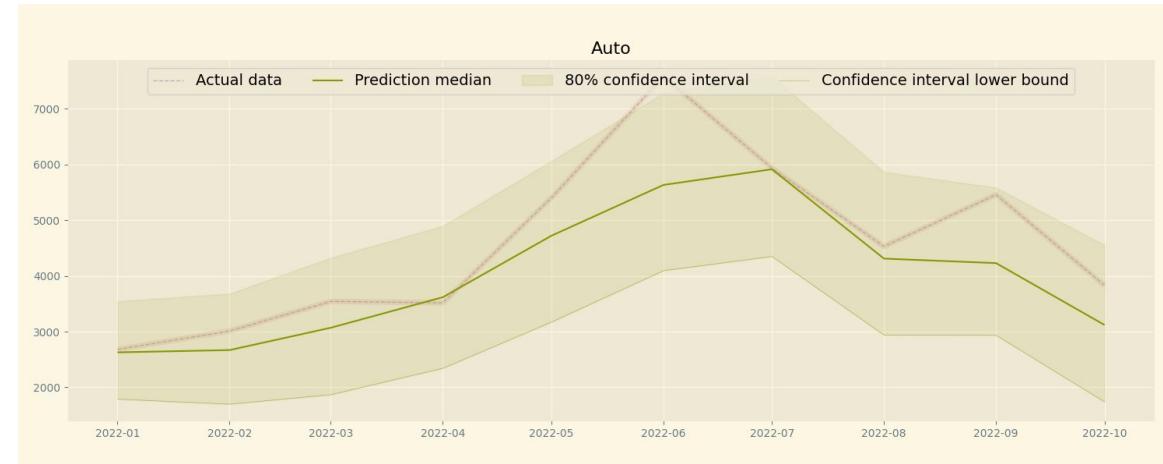
Amazon SageMaker  
Canvas



Amazon Forecast



Amazon SageMaker



AWS

# User Groups



Evaluation



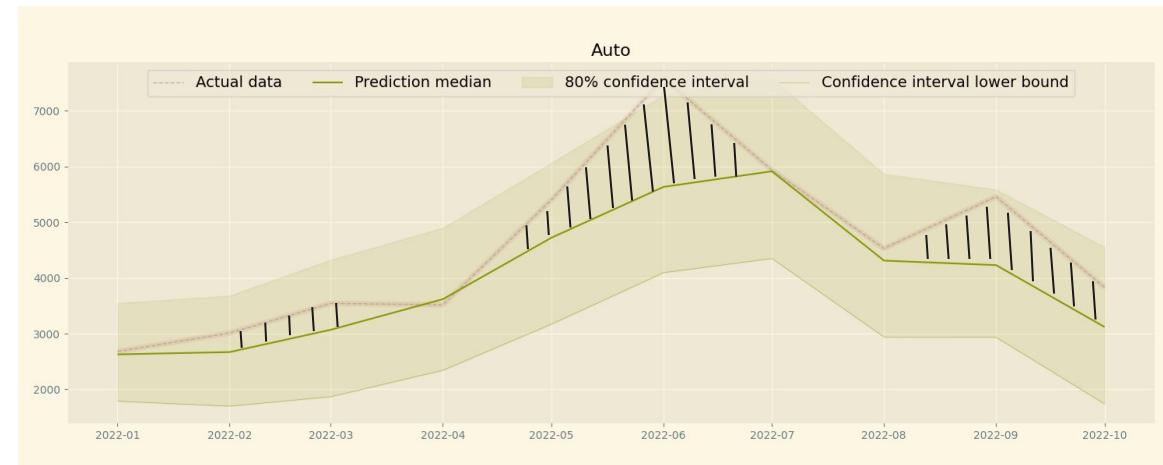
Amazon SageMaker Canvas



Amazon Forecast



Amazon SageMaker



# Evaluation metrics



Metrics	Description	Notes	Limits
MAPE	Mean Absolute Percentage Error	ok < 50%; good < 20%; very good < 10%	for dataset without 0
MASE	Mean Absolute Scaled Error	training / testing values comparison	it is unique for each dataset
RMSE	Root Mean Square Error	RMSE / actual average value < 10%	it is most sensitive to outliers

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## Comparison of AWS services for the forecasting

Services	Difficulty	Execution times	Costs	RMSE
SM Canvas		10 mins	\$ 2.02	280
Forecast		20 mins + 48 mins	\$ 11.28	57
SM <u>JumpStart</u>		5 mins + 28 mins	\$ 0.41	265
SM Built-in algos		3 mins + 10 mins	\$ 0.22	251

# Solution

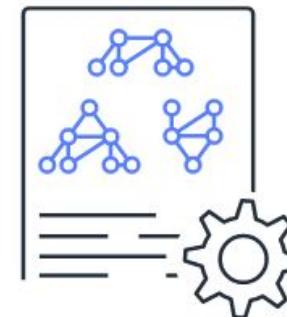


# Amazon Forecast



## Import your data

Datasets are required to train predictors, which are then used to generate forecasts.



## Train a predictor

Train a predictor, a custom model with underlying infrastructure that Amazon Forecast trains on your datasets.

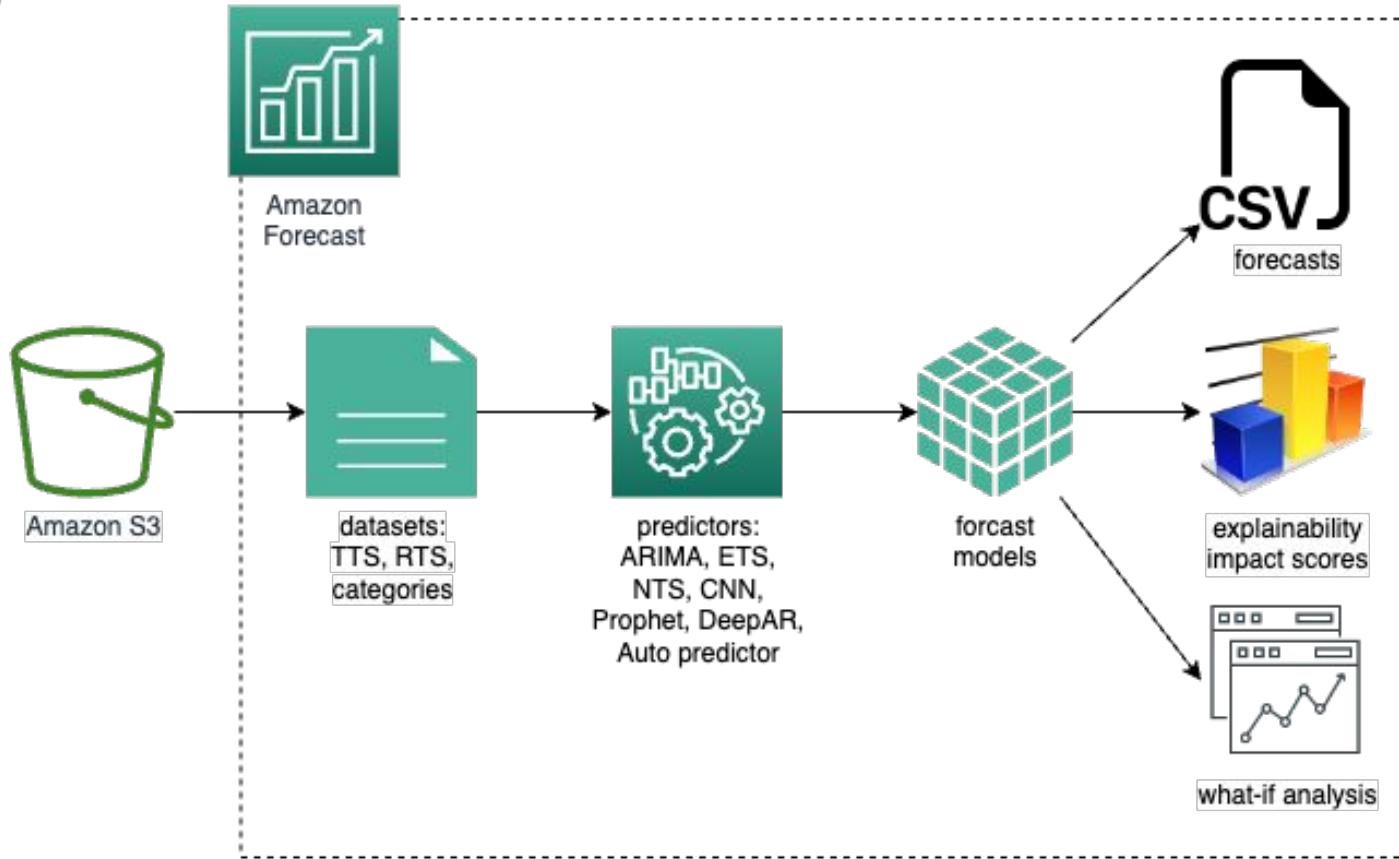


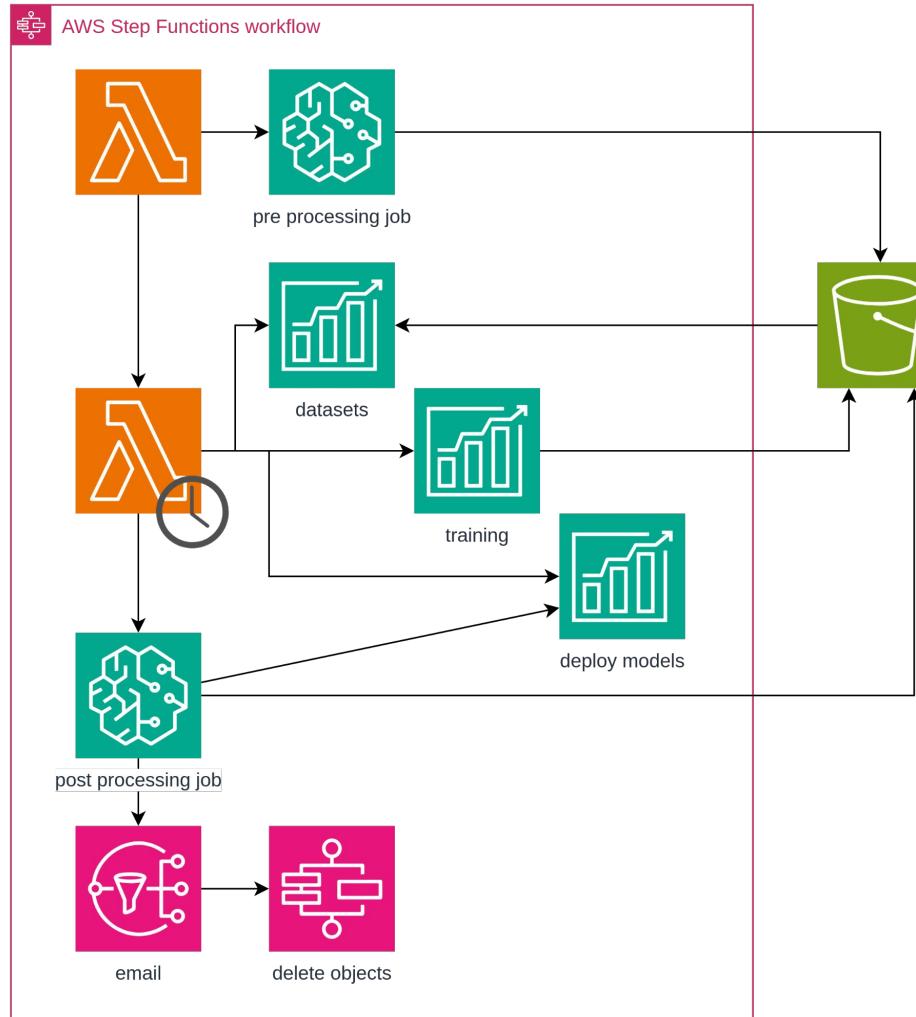
## Generate forecasts

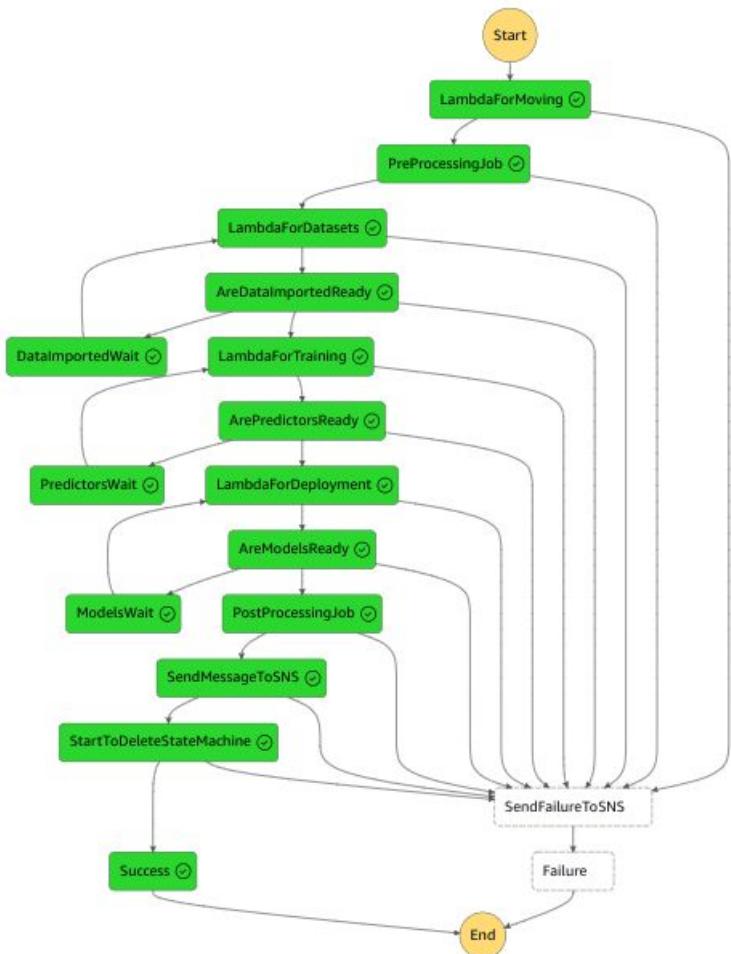
Generate forecasts using your trained predictors.



AWS Cloud







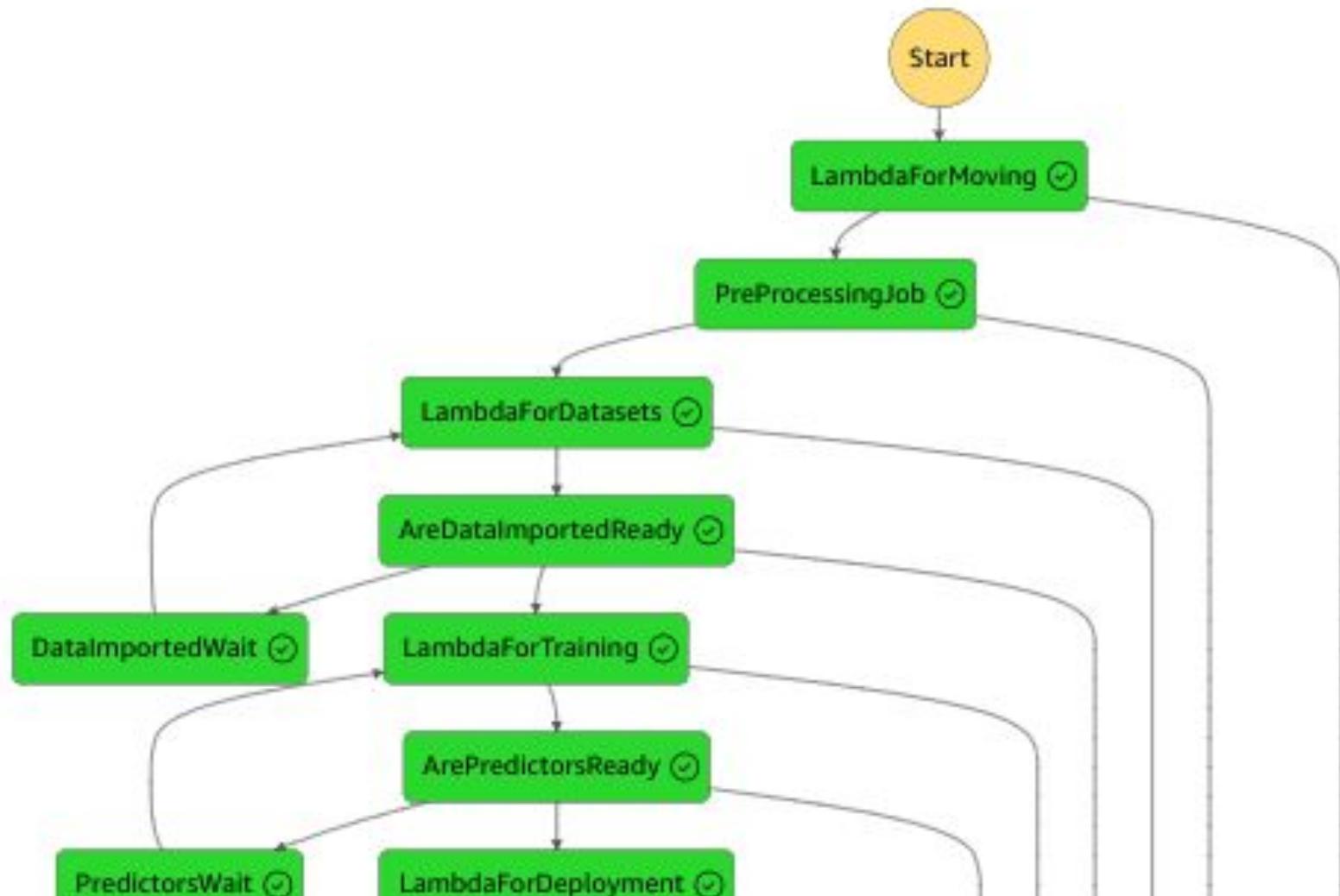
⌚ In progress

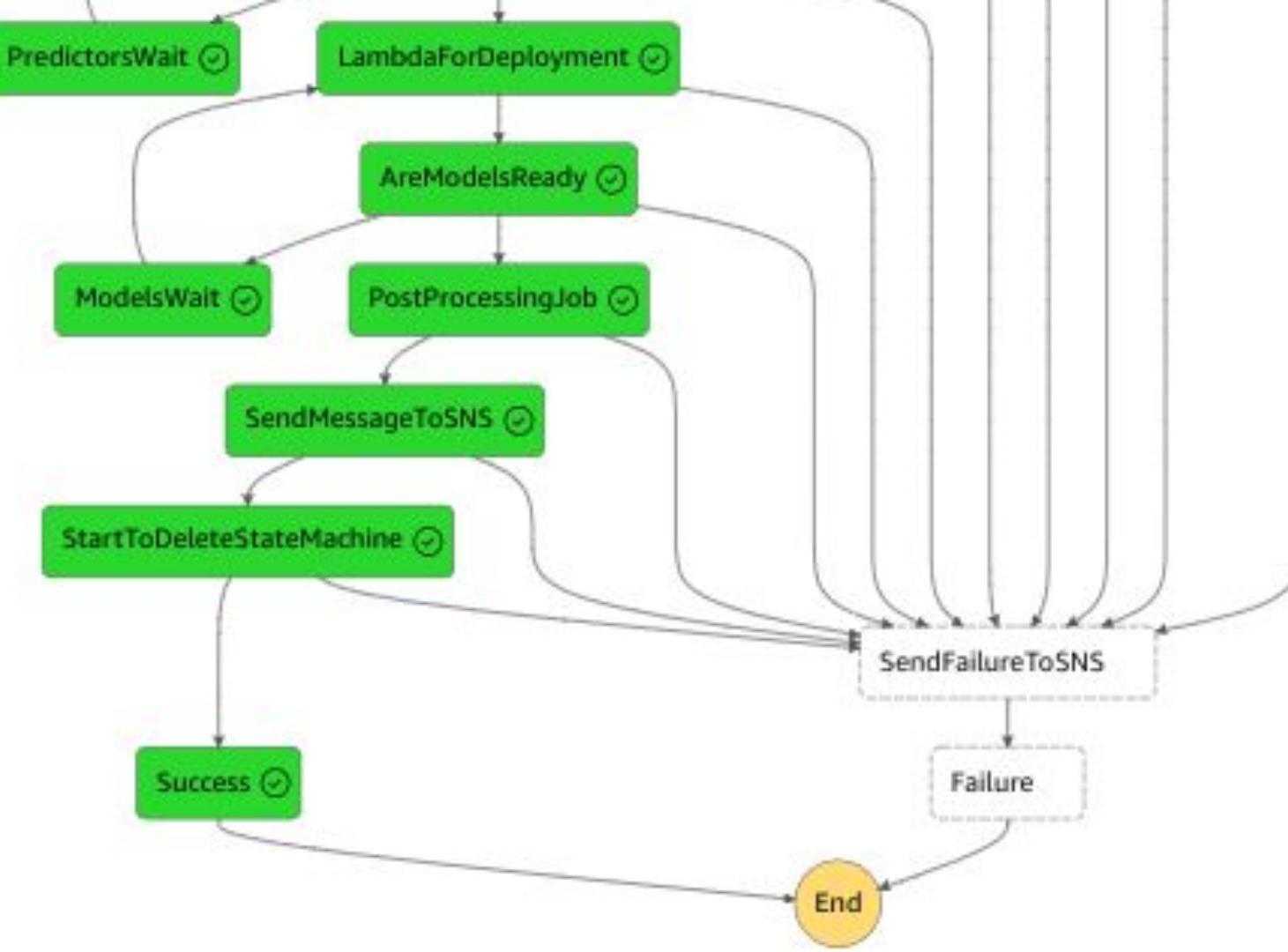
✖ Failed

⚠ Caught error

ⓧ Canceled

✅ Succeeded





# Transition your Amazon Forecast usage to Amazon SageMaker Canvas

by Nirmal Kumar, Biswanath Hore, Dan Sinnreich, and Davide Gallitelli | on 29 JUL 2024 | in [Amazon Forecast](#), [Amazon SageMaker Canvas](#), [Technical How-to](#) | [Permalink](#) |  [Comments](#) |  [Share](#)

*After careful consideration, we have made the decision to close new customer access to Amazon Forecast, effective July 29, 2024. Amazon Forecast existing customers can continue to use the service as normal. AWS continues to invest in security, availability, and performance improvements for Amazon Forecast, but we do not plan to introduce new features.*

[Amazon Forecast](#) is a fully managed service that uses statistical and machine learning (ML) algorithms to deliver highly accurate time series forecasts. Launched in August 2019, Forecast predates [Amazon SageMaker Canvas](#), a popular low-code no-code AWS tool for building, customizing, and deploying ML models, including time series forecasting models.

# Comparison



# Comparison

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1

Amazon SageMaker Canvas  
Quick & Standard

2

Amazon SageMaker AutoML

3

Amazon SageMaker Jump Start

4

Amazon Forecast

# Comparison of AWS services for the forecasting

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Services	Algorithms
Canvas Quick	CNN-QR & DeepAR
Canvas Standard	CNN-QR, DeepAR, Prophet, NPTS, ARIMA, ETS, Ensemble
Forecast	CNN-QR, DeepAR, Prophet, NPTS, ARIMA, ETS, Auto predictor (Ensemble)
Auto ML	CNN-QR, DeepAR, Prophet, NPTS, ARIMA, ETS, Ensemble

# Comparison of AWS services for the forecasting

Services	Algorithms
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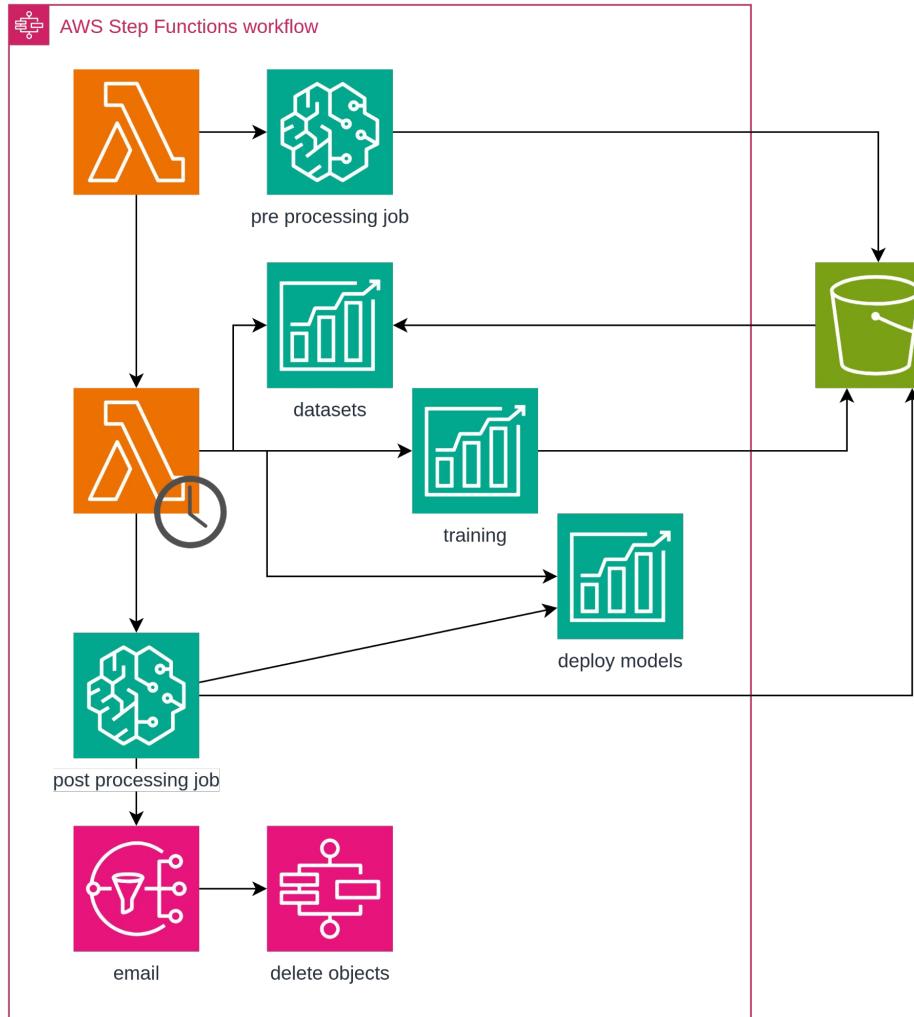
# Comparison of AWS services for the forecasting

Services	Difficulty	Execution times	Costs	RMSE
Canvas Quick		8 mins	\$ 2.88 *	24414
Canvas Standard		31 mins	\$ 7.89 *	11551
Forecast		1 hour 50 mins	\$ 5.31	15561
Auto ML		22 mins	\$ 6.77	13544

\* + \$ 1.9 / hour of Canvas Workspace Instance

# Take Away





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# Questions ?

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# Iniziative - biglietti conferenze



# Iniziative - estrazioni

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# Computer Vision in AWS

Rosilari Bellacosa - CTO @ SynDiag

@AWSUserGroupVenezia #6 #Meetup #AWS

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# Questions ?

@AWSUserGroupVenezia #6 #Meetup #AWS

# Iniziative - biglietti conferenze



# Iniziative - estrazioni

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- live
- excel

# Iniziative - sconto biglietto IDI



# Iniziative - sconto biglietto CloudConf

**CloudConf**

**26 marzo 2025**  
**la CloudConf sta per tornare!**

#cloudops #ai #serverless #iot #security #mlops #coding  
#finops #data #performance

coupon sconto  
**awsugve**  
2025.cloudconf.it

**CloudConf - 26 marzo 2025**  
a Torino, solo in presenza!

Audience  
devOps, developer,  
IT manager, CTO

Evento  
1 giorno conf  
+6 workshop

Non mancare!  
1000 partecipanti  
25 relatori

# Prossimo incontro

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- martedì 18 marzo ore 19:00

# Proposte

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# Spritz



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# Thanks for participating.

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# Test

