



Build more accurate forecasting models with Machine Learning

Amazon Forecast

Anuj Gupta

Senior Solutions Architect

Agenda

- AI/ML Stack
- What is Amazon Forecast?
- Demo
- Use Cases

AI/ML Stack

Broadest & Deepest set of capabilities

Amazon AI/ML Stack: Broadest & deepest set of capabilities

AI SERVICES

Vision


Speech


Language


Chatbots


Forecasting


Recommendations



Amazon Rekognition Image



Amazon Rekognition Video



Amazon Textract



Amazon Polly



Amazon Transcribe


Amazon Translate


Amazon Comprehend & Amazon Comprehend Medical


Amazon Lex


Amazon Forecast


Amazon Personalize

ML SERVICES

AMAZON SAGEMAKER

BUILD

TRAIN

DEPLOY

Pre-built algorithms

Data labeling (Amazon SageMaker Ground Truth)

Algorithms & models (AWS Marketplace for machine learning)

Notebook hosting

One-click model training & tuning

Optimization (Amazon SageMaker Neo)

Hyperparameter optimization


Reinforcement learning


ML FRAMEWORKS & INFRASTRUCTURE


Frameworks


Interfaces

Infrastructure













EC2 P3 & P3dn


EC2 C5


FPGAs


AWS IoT Greengrass


Amazon Elastic Inference


AWS Inferentia

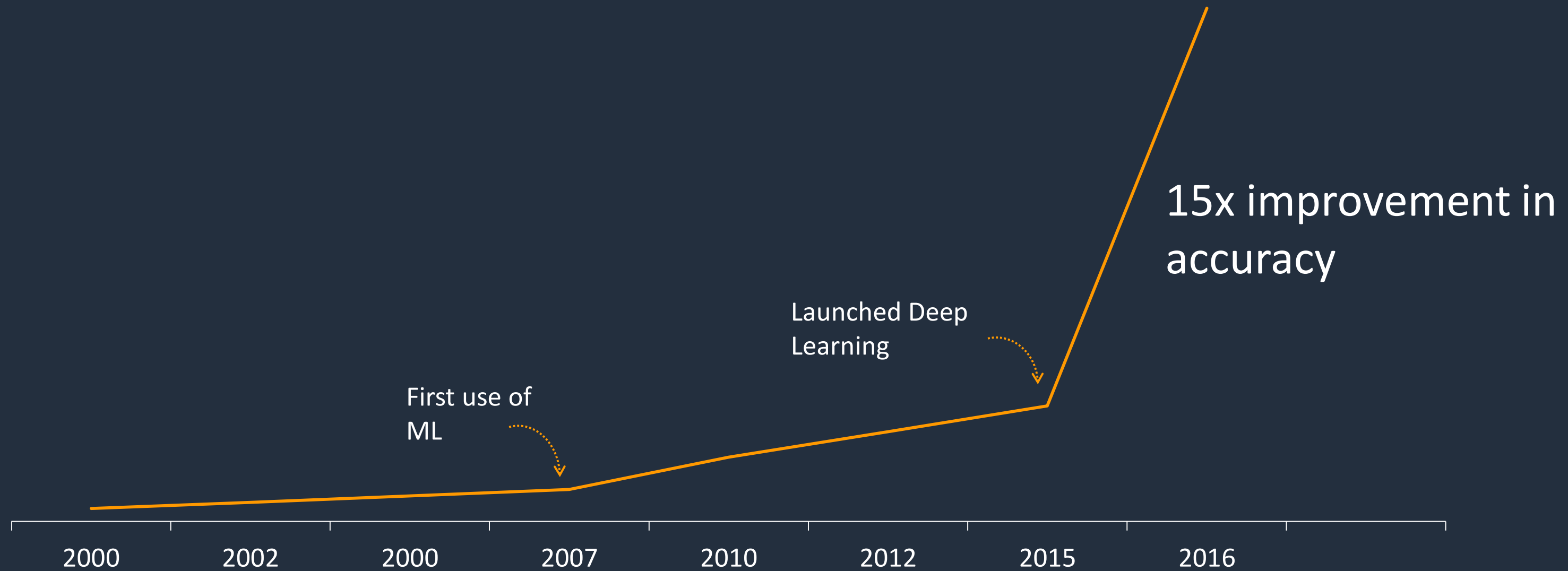
Customers often ask...
“How can we tap into Amazon’s
experience in machine learning?”

Amazon Forecast

Accurate time-series forecasting – **no machine learning experience required**

Forecasting at Amazon

Use of machine learning to solve hard forecasting problems



Forecasting Models

Traditional

- Independent forecasts
- Strong structural assumptions
- High data efficiency
- Data must match the structural assumptions
- Cannot identify patterns across time series

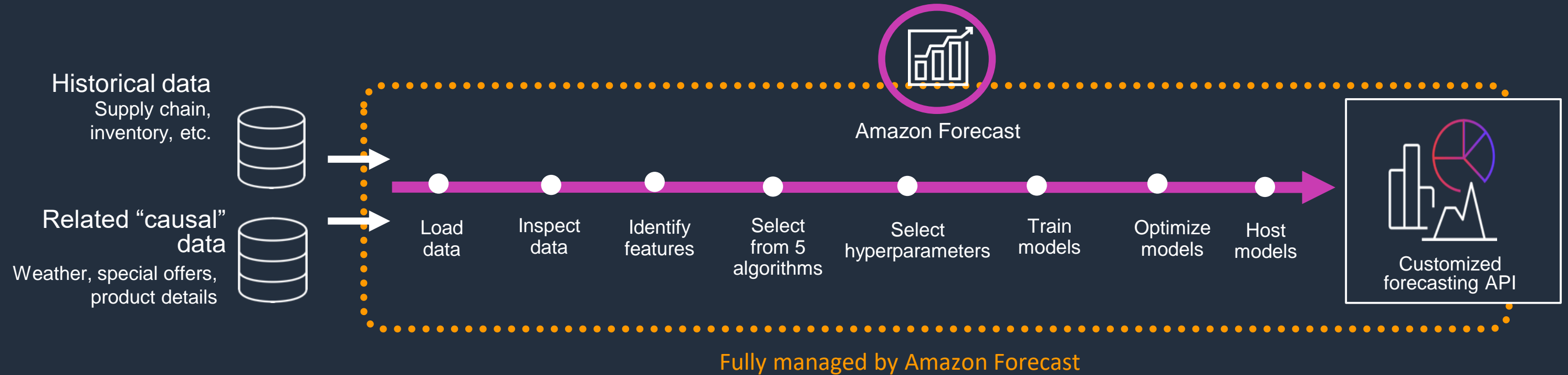


Deep Learning

- Global models: Identify patterns using all available time series
- Weak structural assumptions
- Can be significantly more accurate than traditional methods
- Can easily incorporate and learn from rich metadata
- Support cold-start forecasts for new items

Amazon Forecast

Behind the scenes



Amazon Forecast data ingestion

There are three types of **datasets** in Amazon Forecast

Historic time-series data of items to forecast

Target time-series data

Related time-series data such as price, web hits, etc.

Related time-series data

Attributes of the item such as category, genre, and brand

Item metadata

Amazon Forecast Intuitive Console

Machine Learning

Amazon Forecast

Easily build accurate forecasting models

Amazon Forecast is a fully managed service that uses machine learning to deliver highly accurate forecasts. Based on the same machine learning forecasting technology used by Amazon.com.

View dataset groups

Dataset groups are containers for your datasets, predictors, and forecasts. To view your dataset groups, choose View dataset groups.

View dataset groups

Create dataset group

Create dataset group

Dataset groups are containers for all your datasets.

Dataset group details

Dataset group name

The name can help you distinguish this dataset group from other dataset groups on the dataset groups dashboard.

NorthAmerica_Inventory_Planning

The dataset group name must have 1 to 63 characters. Valid characters: a-z, A-Z, 0-9, and _

Forecasting domain

A forecasting domain defines a forecasting use case. You can choose a predefined domain, or you can create your own domain.

Inventory planning

Forecast demand for raw materials and determine how much inventory of a pa...

Cancel

Next

Create target time series dataset

Create target time series dataset

Dataset details

Dataset name

The name can help you distinguish this dataset from other datasets on your Datasets dashboard.

UnitedStates_ProductDemand

The dataset name must have 1 to 63 characters. Valid characters: a-z, A-Z, 0-9, and _

Frequency of your data

This is the frequency at which entries are registered into your data file.

Your data entries have a time interval of

1

day

Data schema

To help Amazon Forecast understand the fields in your data, you must define the schema. Specify the attributes in the same order as they appear in your CSV file. The pre-populated attributes below are required for the chosen domain.

1

{

2

3

4

5

6

7

8

9

10

11

12

13

14

}

15

16

}

"Attributes": [

{

"AttributeName": "item_id",

"AttributeType": "string"

},

{

"AttributeName": "timestamp",

"AttributeType": "timestamp"

},

{

"AttributeName": "demand",

"AttributeType": "float"

}

]

}

Cancel

Previous

Next

Create dataset group

Import target time series data

Dataset import details

Dataset import name

The name can help you distinguish this dataset import from other imports on your dataset detail page.

ProductDemand_Q3_2019

The dataset import name must have 1 to 63 characters. Valid characters: a-z, A-Z, 0-9, and _

Timestamp format

This is the format of the timestamp in your dataset. The format that you enter here must match the format in your data file.

yyyy-MM-dd HH:mm:ss

IAM Role

Dataset groups require permissions from IAM to read your dataset files in S3. Choose or create a role using this control.

AmazonForecast-ExecutionRole-1570237640889

Data location

The location is the path to the file in your S3 bucket that contains your data.

s3://my-bucket/product-demand-q4-2019.csv

Your files must be in CSV format.

Cancel

Previous

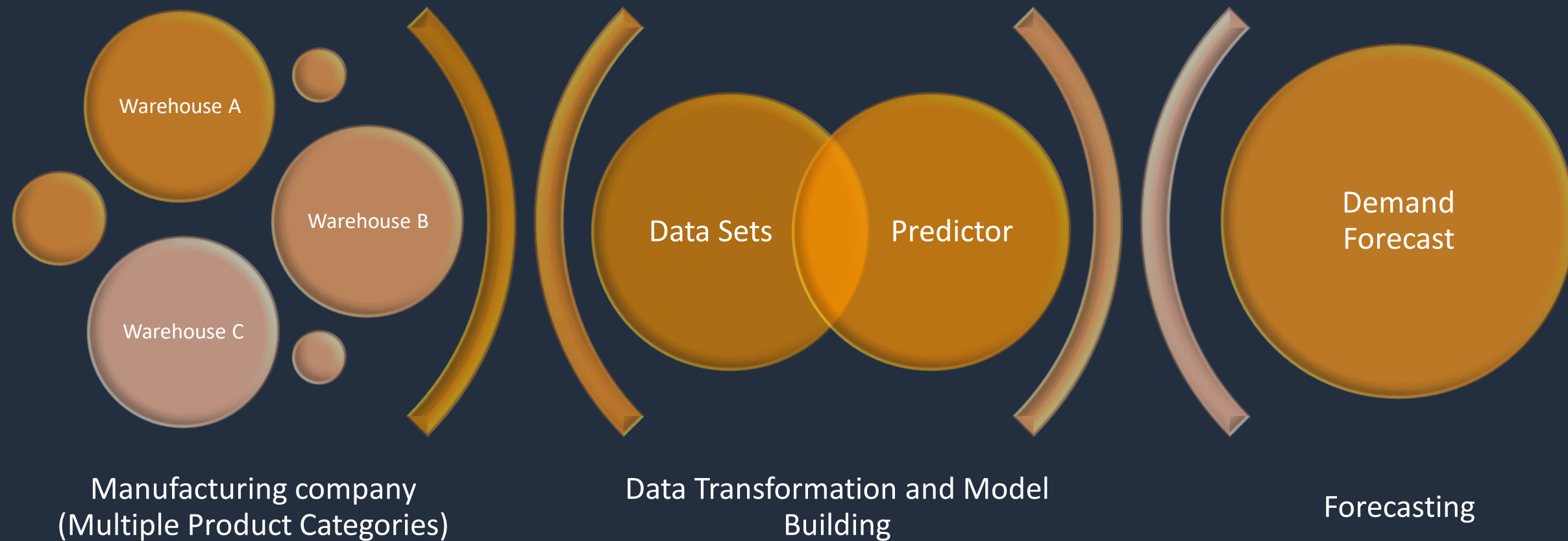
Start import



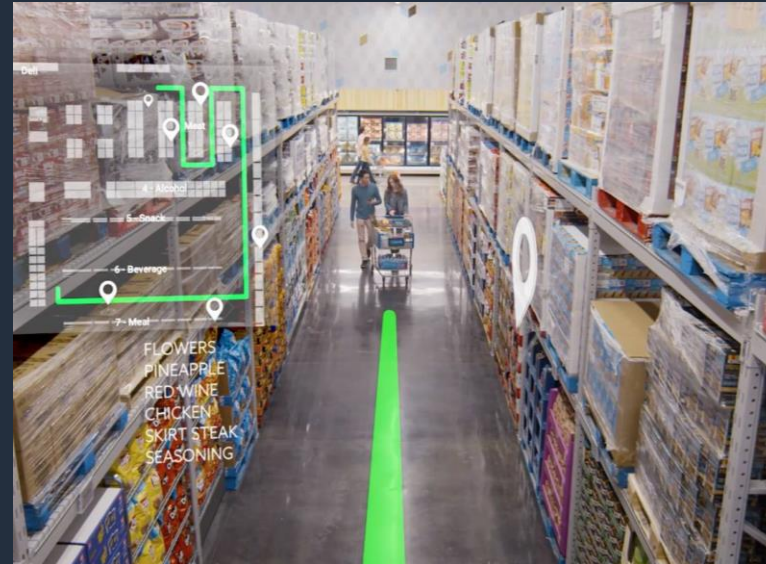
Demo

Build Forecasting Model for Inventory Planning

Demo – Use Case



Common Use Cases



Getting Started

Docs:

- <https://docs.aws.amazon.com/forecast/latest/dg/what-is-forecast.html>
- <https://docs.aws.amazon.com/forecast/latest/dg/gs-cli.html>

GitHub Samples:

- <https://github.com/aws-samples/amazon-forecast-samples>

Blogs:

- <https://aws.amazon.com/blogs/aws/amazon-forecast-now-generally-available/>
- <https://aws.amazon.com/blogs/aws/amazon-forecast-time-series-forecasting-made-easy/>

Q&A

Thank you!