

SMART INVENTORY MANAGEMENT

**Leveraging Big Data - AWS S3, Athena,
Sagemaker and QuickSight**

TEAM 12

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Motivation

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Why inventory
management
analysis?

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Who can benefit
most from our
project?

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What is the general
procedure of smart
inventory management?

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Why AWS? Why is it
superior for smart
inventory management
involving big data?

Our Use case

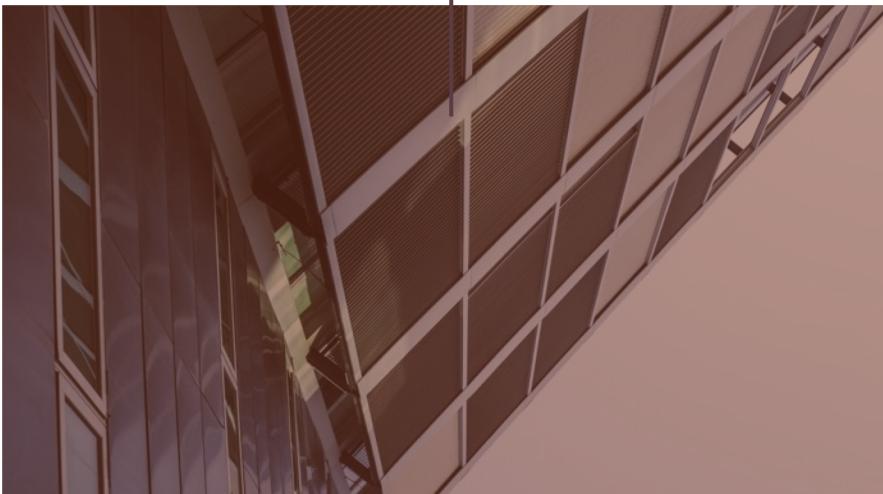
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Description of dataset;
Results:
Feature engineering,
modeling, visualisation

PAS T

Challenges faced by traditional legacy systems

- Inability to handle high data volumes
- Costly storage
- High Latency due to low computational power
- Poor Integrability with various systems/data sources



NOW

How Big Data solves the challenges?

The value of big data is how quickly patterns and trends can be identified

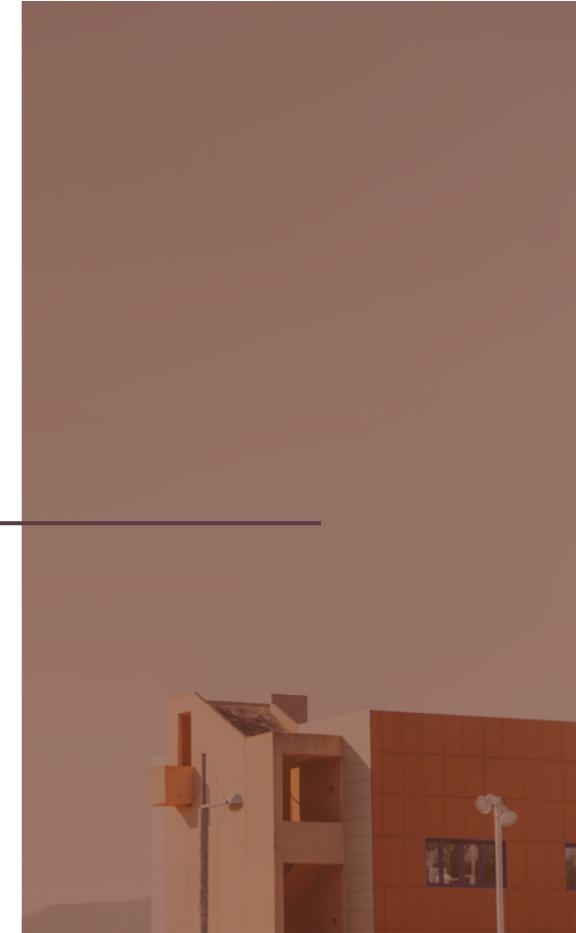
- Rapid analysis of vast amounts of information at substantially faster speeds.
- Reduced Costs By Migrating to the Cloud
- Seamlessly integrated into existing systems at low costs.

OUR MOTIVATION

The inability in inventory management leads to:

- ❖ poor service quality,
 - ❖ unsatisfied customers,
 - ❖ excess/inadequate amount of stock
-

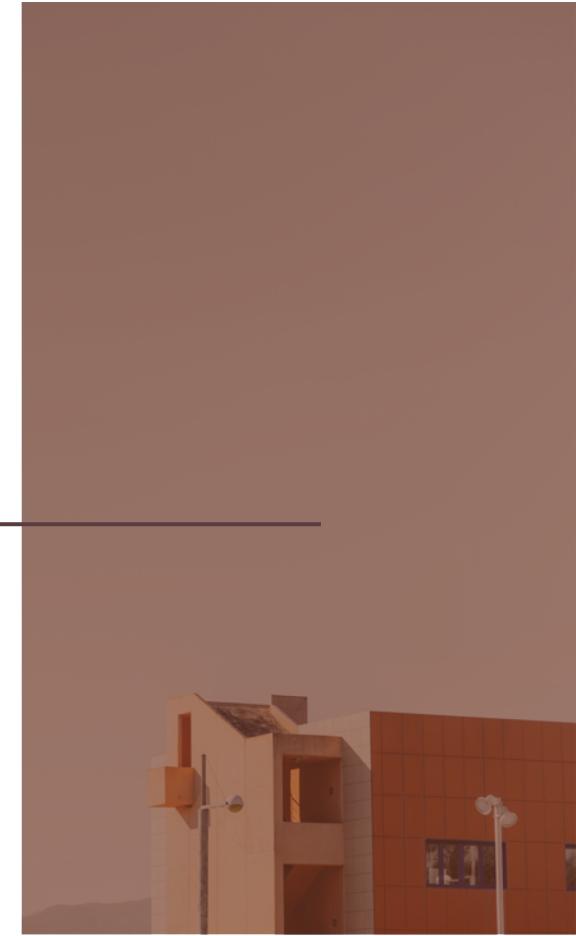
Cloud computing platforms such as AWS makes it possible to analyze tons of data collected from daily inventory management.



OUR MOTIVATION(cont'd)

In the era of big data, we are able to build predictive models to make:

- seasonal predictions using historical data (e.g. retail store)
- real-time inventory forecast for fast moving products such as perishable products (e.g. bakery) or e-commerce using streaming data



TARGET AUDIENCE

Big-data related inventory management has wide applications across industries.

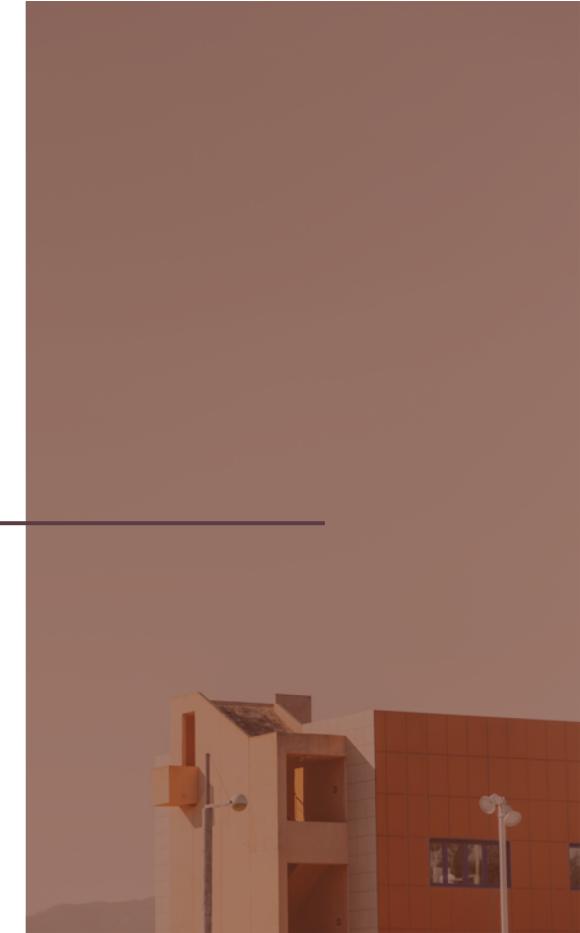
Examples:

Physical Retail stores involving:

- Food and beverage
- Apparel ...

E-Commerce platforms:

- Amazon
- Best Buy ...



BUSINESS IMPACT

1. *Improved operational efficiency*

Historically, employees at retail stores spent hours to manually check the shelves, and make subjective decisions on product replenishment.

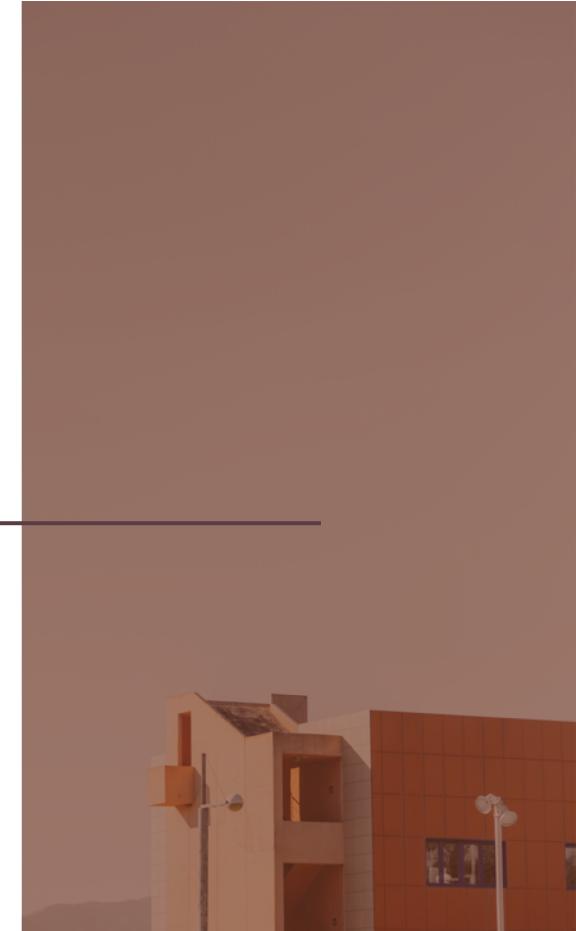
Now, significant decrease in out-of-stock events, spend half an hour to look into the suggestions offered by predictive models.



BUSINESS IMPACT (cont'd)

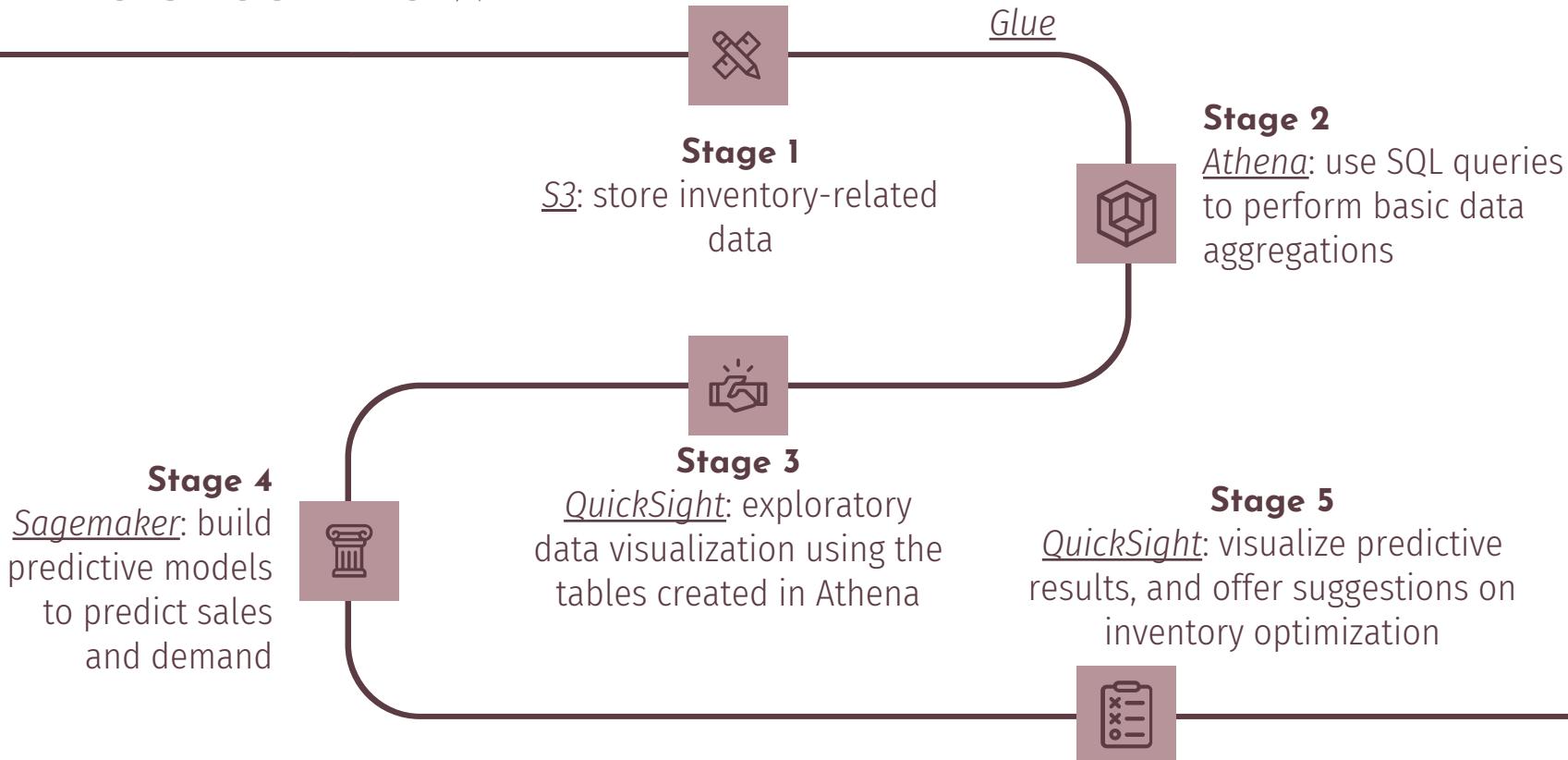
2. *Cost-saving for retail stores*

- customer retention
 - > reduce the possibility of product shortage
 - > improved customer satisfaction
 - > reduce cost in customer retention
- inventory management
 - > avoid excess supply to reduce storage cost
 - > avoid product waste



PROCESS FLOW

PROCESS FLOW



TECHNOLOGIES

S3: object storage platform used to store and retrieve any amount of data from anywhere

Glue: fully managed extract, transform, and load (ETL) service that makes it easy to prepare and load data for analytics

Sagemaker: machine learning services that enable us to deploy predictive models quickly.

Athena: interactive query service that makes it easy to analyze data stored in S3 using SQL

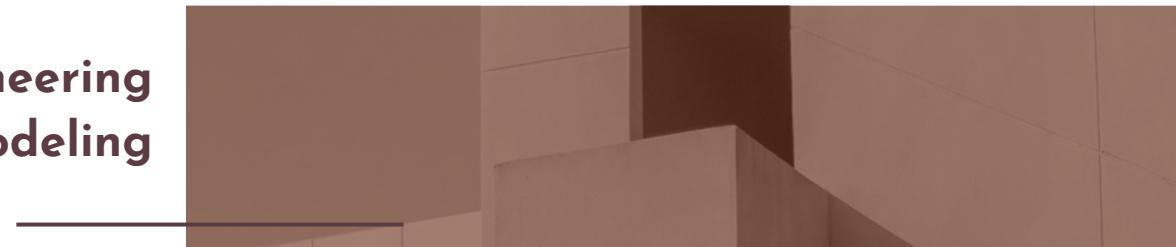
QuickSight: a fast, cloud-powered business intelligence service that makes it easier to create interactive dashboard that include ML insights.

OUR USE CASE

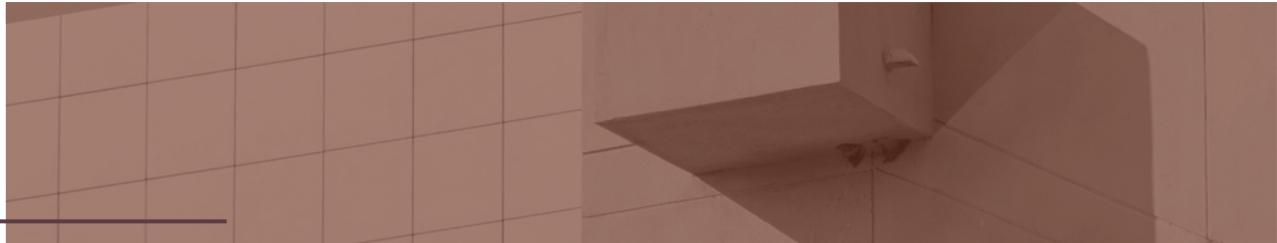
Stage 1 - Dataset



**Stage 2 - Feature Engineering
& Modeling**



**Stage 3 -
Visualization**



DATASET

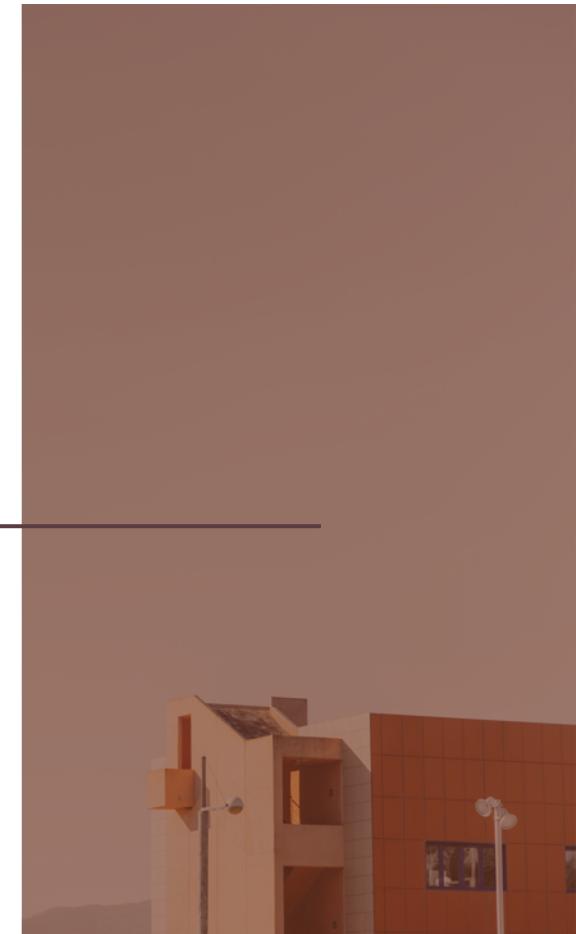


- Historical sales transactions for bakery goods (BIMBO) in Mexico
- Training data : 7 weeks
- Testing data : 2 weeks
- Data fields:
 - week number
 - sales channel
 - sales depot (id, location - town, state)
 - client (id, client name)
 - product (id, product name)

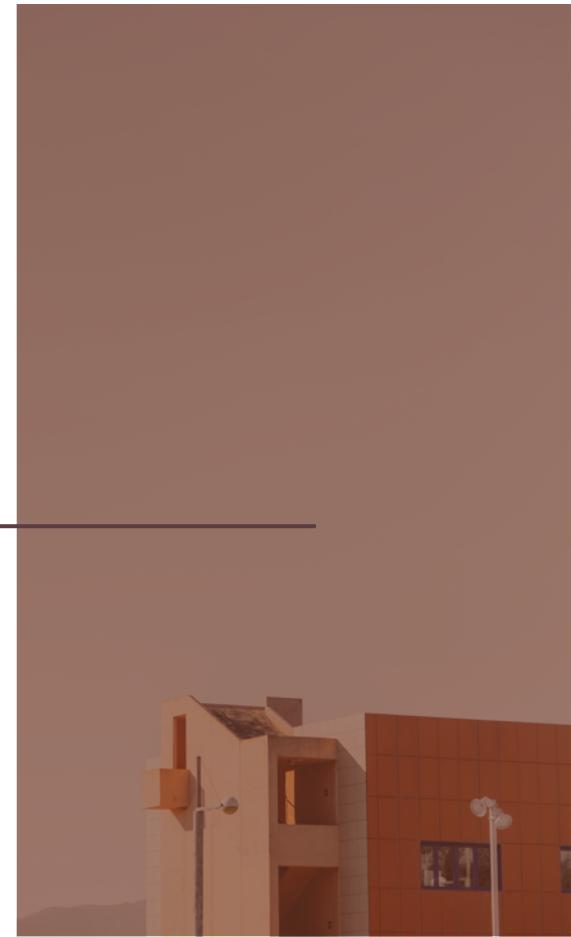


FEATURE ENGINEERING & MODELLING

- Feature processing with Scikit-Learn on Sagemaker notebook
- Prediction using estimators in Sagemaker
- End to end deployment using Amazon Sagemaker Inference pipelines



VISUALIZATIONS



Business Performance Overview

Avg.Units Sold Per Week

78.4M

Units Sold by Week



Avg.Sales Per Week

548.9M

Sales by Week



Top Sellers

Mantecadas Vainilla

Tostado

Barritas Fresa

Madalenas

Pan Blanco

Donitas Espolvoreadas
Tortillinas

Panque Nuez

Gansito

Pan Integral

Medias Noches

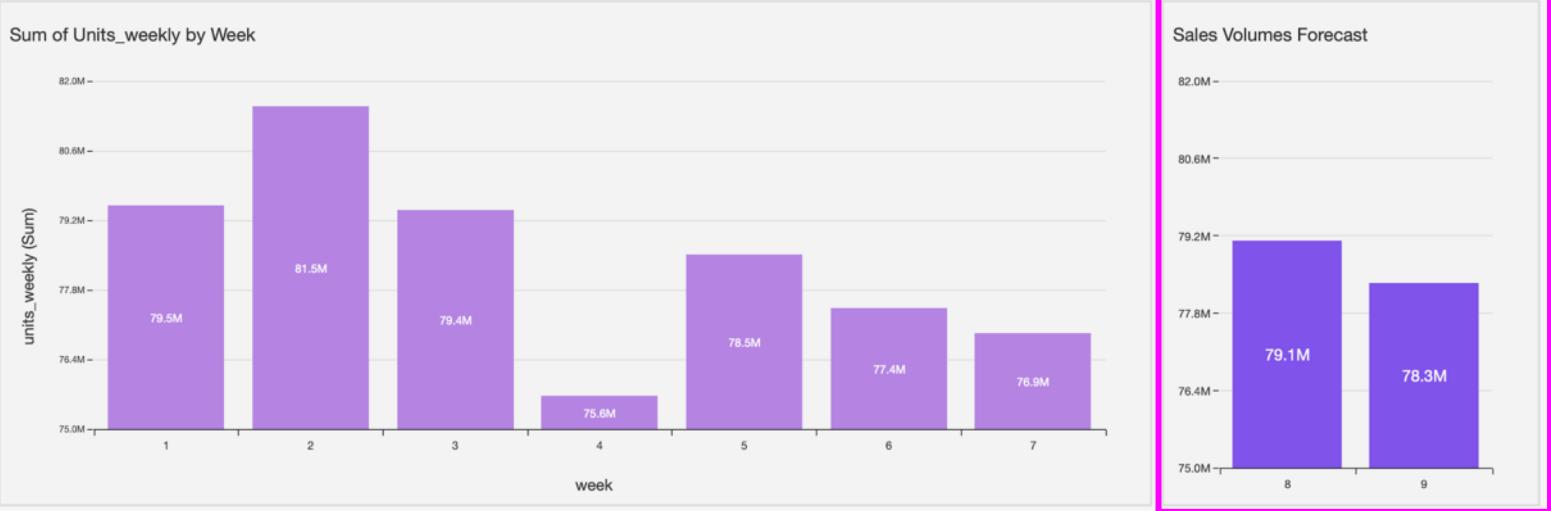
Nito

Donas Azucar

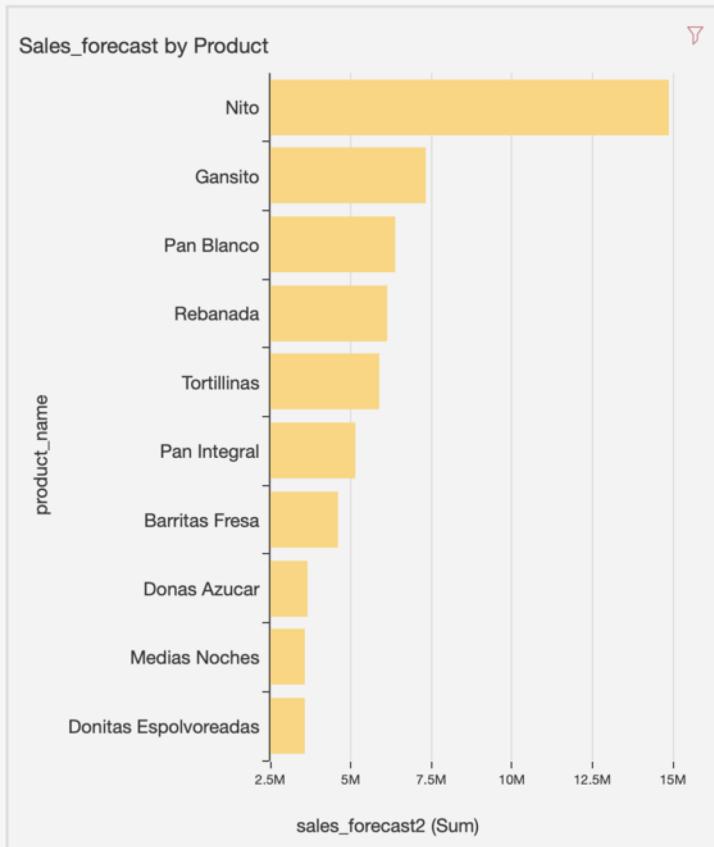
Principe

Rebanada

Sales Forecasting for the Upcoming Weeks



Better Plan Products Inventory Based on Forecast



THANKS

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