

DATA+AI
SUMMIT 2022

TREDENCE
— Beyond Possible —

ON-SHELF AVAILABILITY (OSA)

Smart alerting system to predict OOS using AI/ML



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ORGANIZED BY  databricks



Key Take-aways

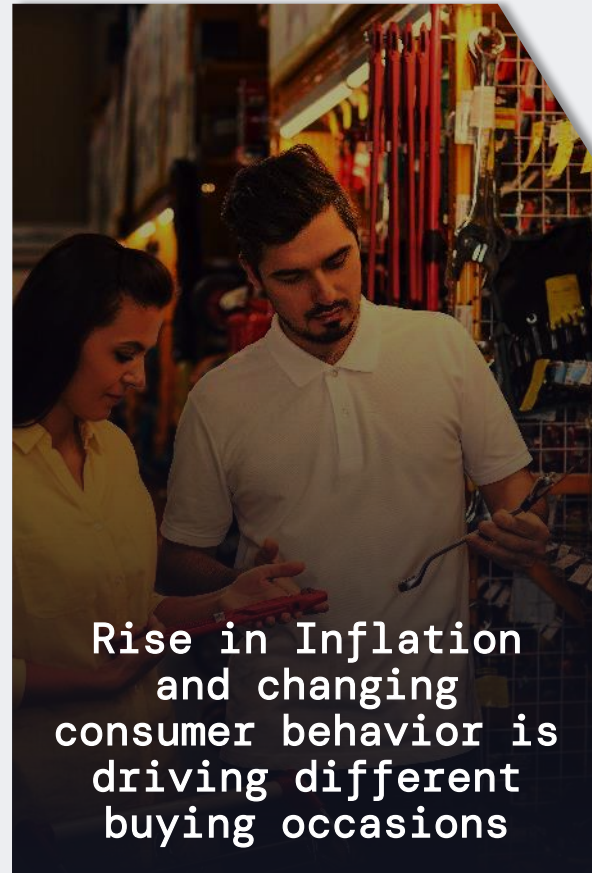
- 01** Industry Challenges & Current State
- 02** Tredence Approach and Customer Success Stories
- 03** Tredence OSA Solutions powered by Databricks and Azure

Takeaway 1

Industry Challenges & Current State

Industry challenges disrupting CPG / Retail performance

Impacting growth and profitability



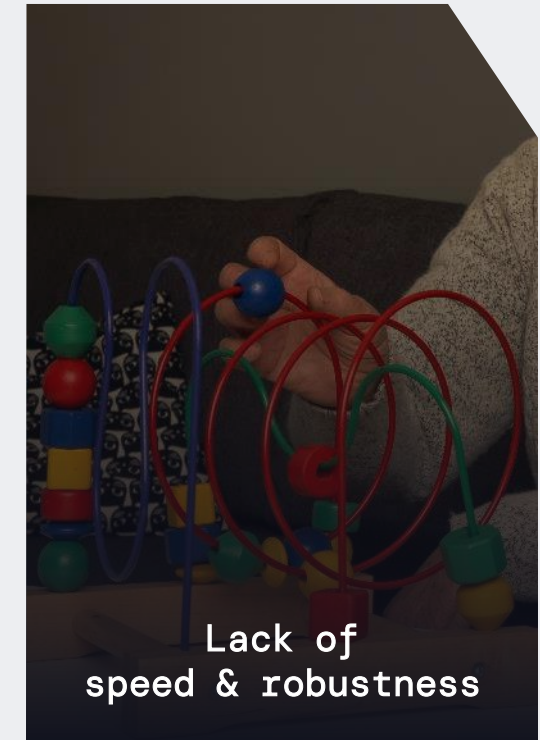
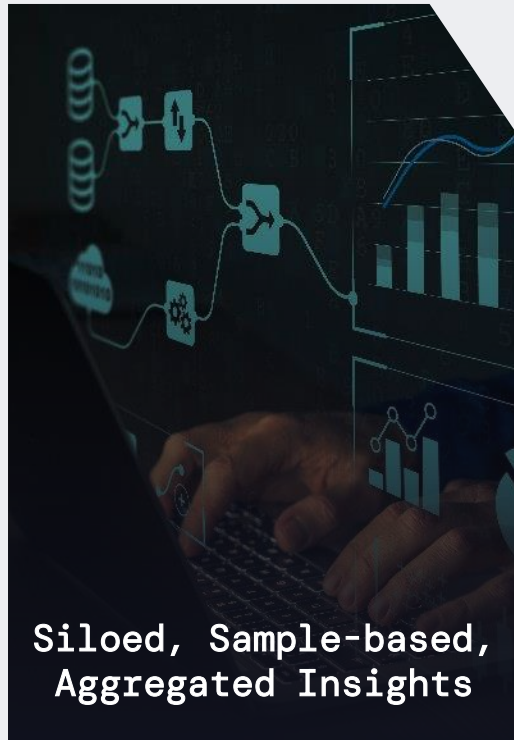
- **\$1 Trillion** Lost Retail Sales
- **7.4%** of CPG sales go unrealized
- **32% of shoppers** encountered empty shelves
- **18% of Shoppers** didn't find the same price as given in the ad

Retailer or Channel Switching

Brand switching

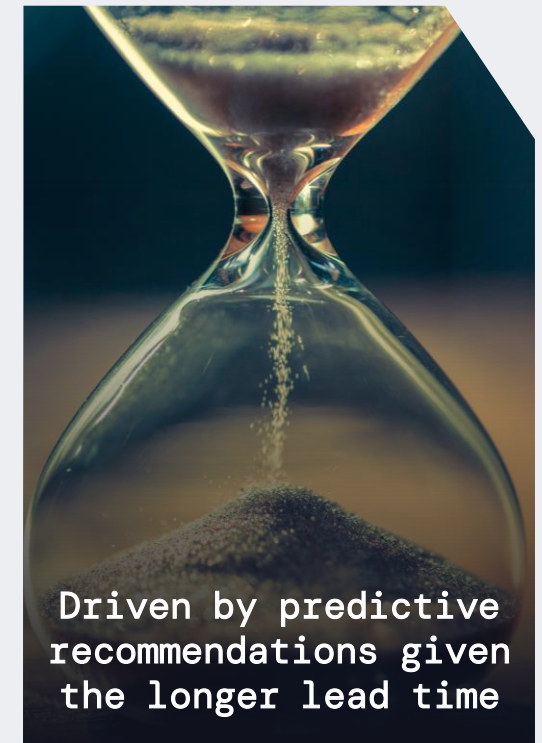
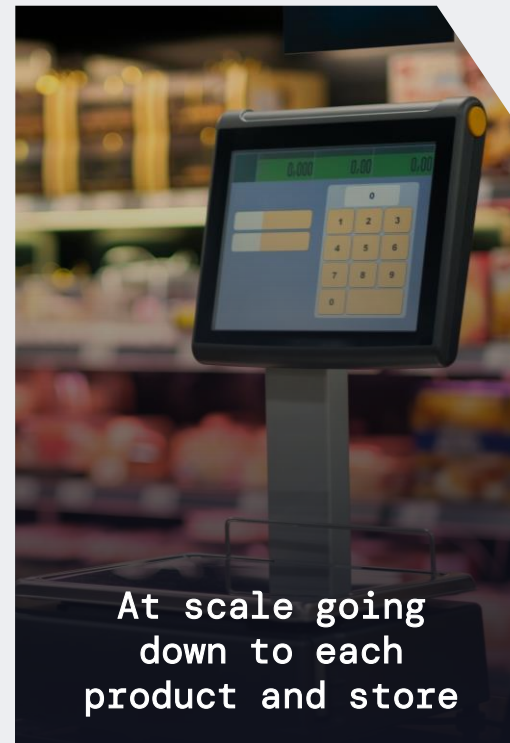
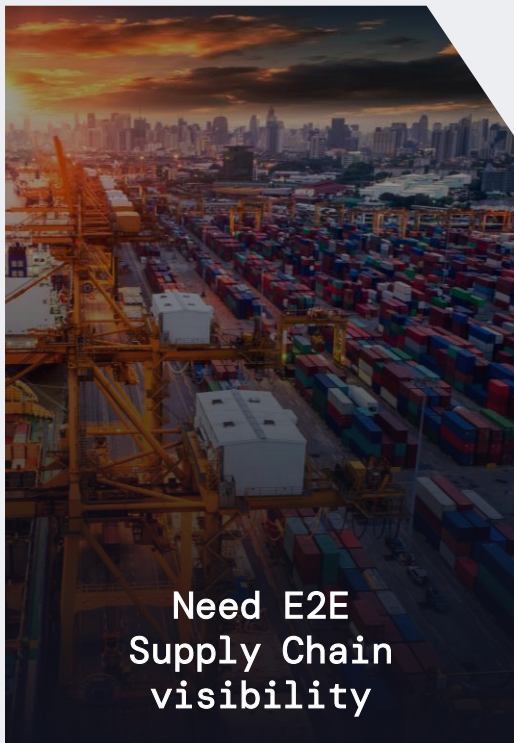
Current approach limits the actionability

Calling for a more sophisticated solution



To improve OSA, CPGs need an E2E transformation

Right product at right store: Drive precise action at scale



Takeaway 2

Tredence Approach and
Customer Success Stories

Fixing OSA issues requires an E2E approach

Measure gaps, identify root cause, recommend action

Current State



Current OOS tracked and captured



Forecasted OOS predicted (2-week)



Classification of OOS



Identification of root-cause



Preemptive intervention and strategic changes

Ideal Approach



- Analyze historical OOS issues and categorize into **sporadic** and **chronic**
- Focus on chronic



- Identify **Supply Chain process gaps** causing Chronic issues



- ML algorithms** to identify:
- **Root-cause**
 - Right levers for action



- Create learning & **feedback loop**
- Recommend Action

Example

Consistent inadequate forecasts to meet demand

OOS at POS during promotions

Forecast Accuracy during Promotions

During promotions: Adjust Forecast; Recommend Display to increase shelf-space



Way Forward

Setup OOS classification and Root Cause Identification



Recommend new strategies



Evaluate Feasibility and Prioritize Actions



Strengthen partnership with retailer via increased transparency

Customer Success Stories

Built an ML based automated system to generate smart alerts for merchandising reps at a store level based on off-sales trend

Identifying OOS Situation: at a Store X SKU level

Identifying Off-Sales Behavior: attributable to phantom inventory, inventory lower than threshold or inefficient store operations

Smart Alerts: alerts for the store manager and merchandising reps to maintain optimal stock

Estimated ~9% lift

~1% revenue lift for every ~2% improvement in stock availability

Automated store replenishment recommendation system to increase the On-Shelf Availability

Identifying OOS Situation: Store inventory estimation using distributor invoices and retailer POS data.

Identifying Off-Sales Behavior: Decision Tree model using heuristically applied rules on calculated inventory and derived indicators to identify replenishment opportunity

Smart System: Built an AI solution that generated stock out alerts for the distributors and store manager

13% increase in distributor invoices

22% increase in In-Store Metrics

Takeaway 3

Tredence OSA Solutions
powered by
Databricks and Azure

OSA Accelerator Overview

Data

- POS - Sales
- POS - Inventory
- Replenishment
- Promotions
- Audit
- Store Master

Analytics & ML

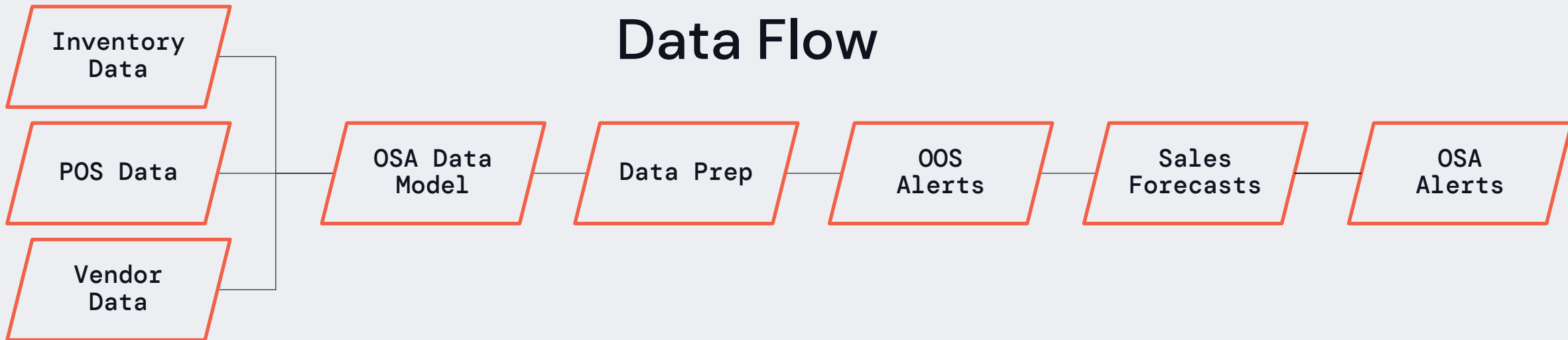
- Ingest to OSA data model
- Cleaning and EDA
- ML Forecasting
- Business rules for alerts

Alerts

- Alerts for different Scenarios
- Root cause analysis
- Prescriptive interventions

Last Mile Adoption

- Web app for merchandising and inventory teams
- User persona-based dashboards



Identifying the right types of Alerts in the E2E OSA Solution

Inventory, stock and sales

Zero-stock records & Phantom Inventory

1



Misalignment of reported vs. actual saleable inventory

Safety Stock Violations

2



Breached and outdated thresholds of safety stock not aligned to current demand and events

Zero Sales Events

3



Anomalies of Zero sales based on cumulative probability threshold

Out-of-stock

4



Actual sales < natural sales velocity

Off Sales

5

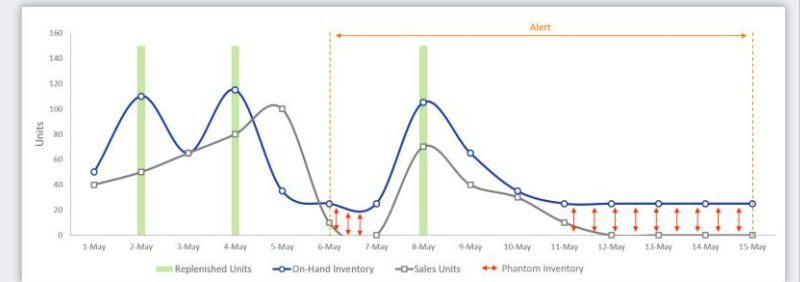


Difference of actual vs. predicted sales over past N days

OOS Alert Scenarios

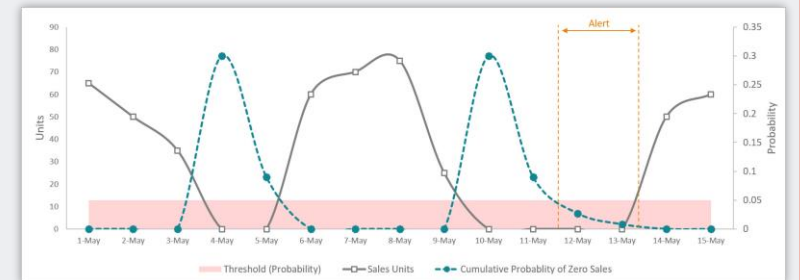
Phantom Inventory

- Poor tracking of replenishment units, undetected shrinkage
- Out-of-band processes
- Misalignment of reported inventory with actual inventory



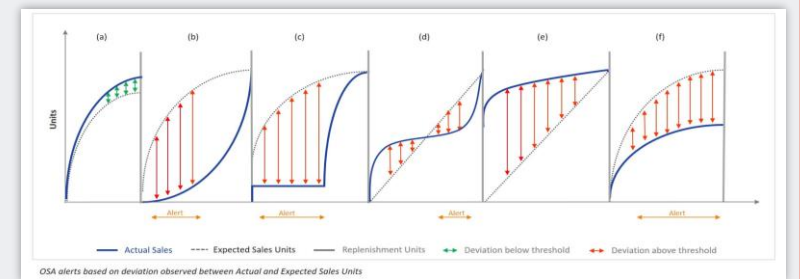
Zero Sales

- Zero sales of a product does not always mean OOS
- Important to differentiate Seasonal behavior vs OOS
- Identify anomalies of Zero sales based on cumulative probability threshold

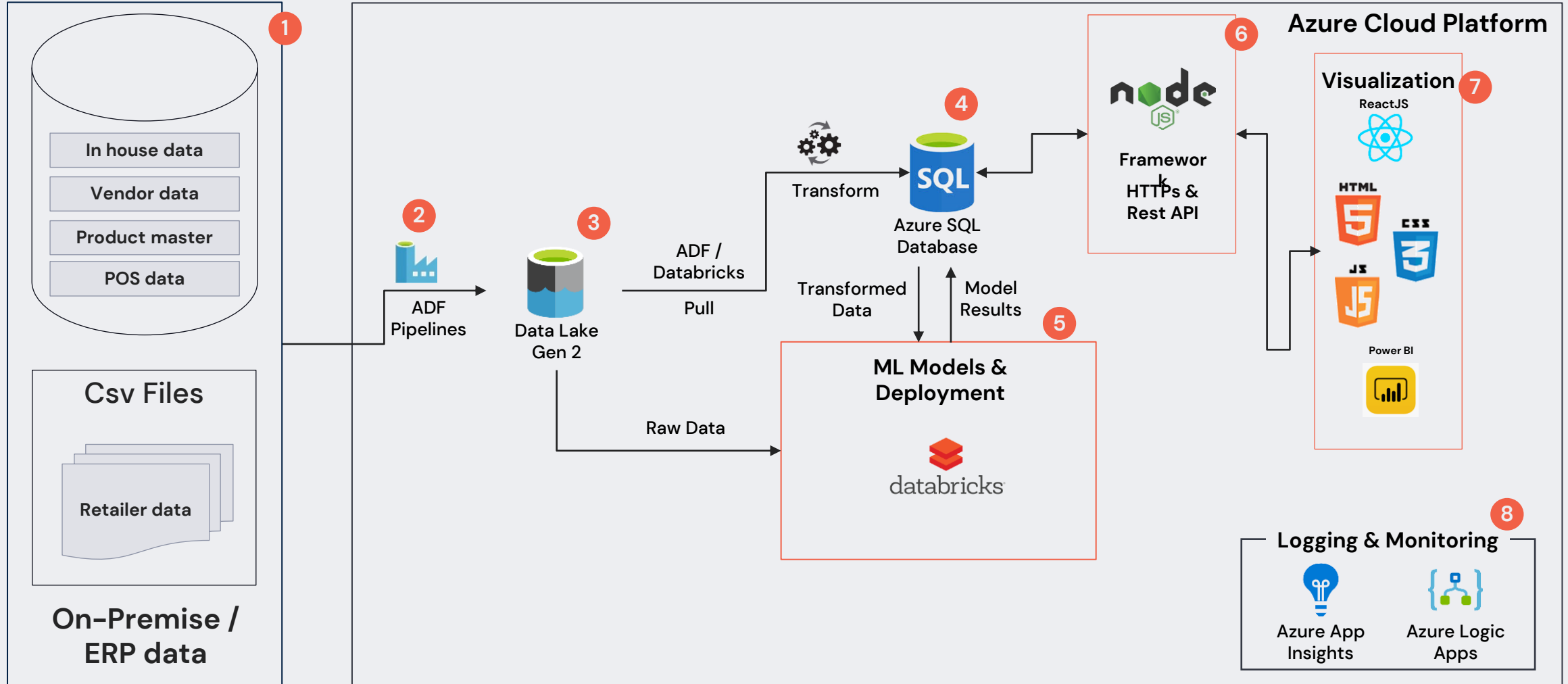


Off Sales

- Incorrect product placement
- Suboptimal inventory practices make products inaccessible to customers
- Identifying this can reduce 'perceived OOS'



Technical Architecture



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Thank you



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