

REACH 2021

—

SONAE MC



MIGROS  
TICARET A.Ş.

THEME CHALLENGE  
PREDICTION OF  
CONSUMER BEHAVIOUR IN  
EMERGENCY SCENARIOS

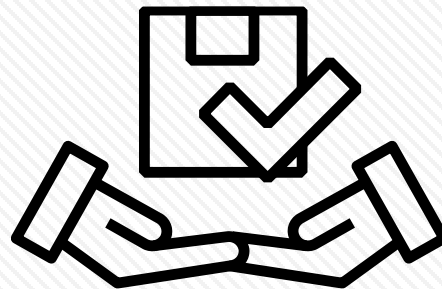
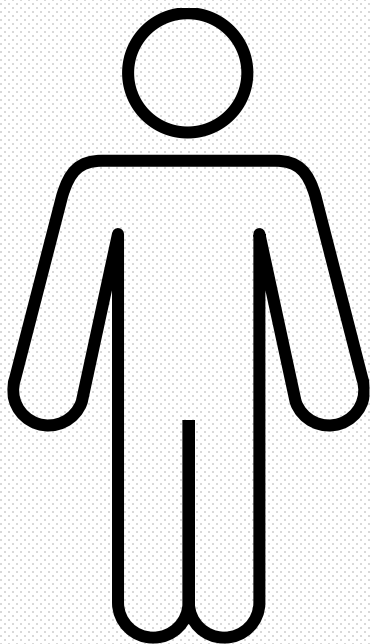
CYC

01

—

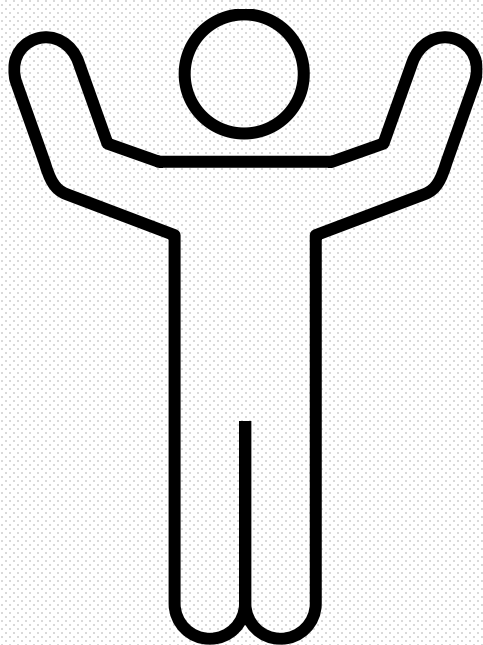
DEMAND PLANNING,  
EVEN WHEN  
THE RULES CHANGE

## WHO IS THE DEMAND PLANNER?



## WHO IS THE DEMAND PLANNER?

---



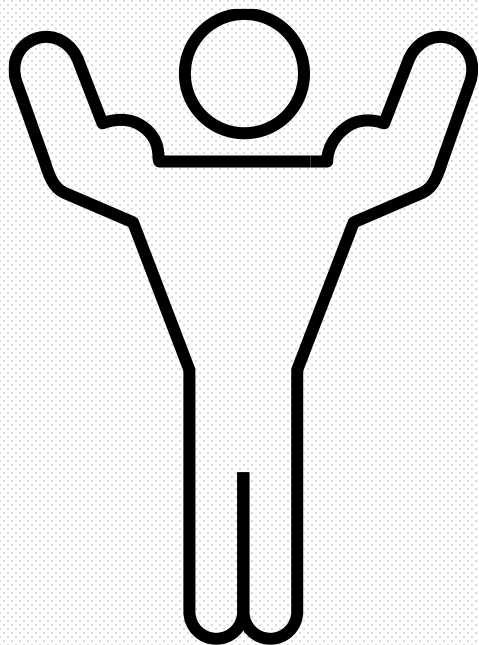
DETAILED AND  
ACCURATE DATA

---

EASY TO USE TOOLS  
TO GET INSIGHTS

## WHO IS THE DEMAND PLANNER?

---



DETAILED AND  
ACCURATE DATA

---

EASY TO USE TOOLS  
TO GET INSIGHTS

---

TREND ANALYSIS  
AND FORECAST

## STUDENLY THE RULES CHANGE



## STUDENLY THE RULES CHANGE



**EARTHQUAKES  
TSUNAMIS**

**CHEMICAL/NUCLEAR CATASTROPHES**



## STUDENLY THE RULES CHANGE



**MAD COW DISEASE**  
**BIRD FLU**  
**SWINE INFLUENZA**





## STUDENLY THE RULES CHANGE



## STUDENLY THE RULES CHANGE

**CNN BUSINESS** Markets Tech Media Success Perspectives Videos Edition

# Gasoline demand spikes in several states after pipeline hack

By [Matt Egan](#), CNN Business  
Updated 11:19 GMT (19:19 HKT) May 12, 2021

### TOP STORIES

'There is this bloodthirsty... in in our party': GOP Arizona

Analysis: AOC just made... Taylor Greene's antics su...

Recommended by

**Ad** Talend

Build a True Data Lake with a Cloud Data Warehouse

A Single Source of Truth That's Secure, Governed and Fast

## EMERGENCY SCENARIOS

UNCERTAINTY

SHORTAGE OF ITEMS

ECONOMIC PROBLEMS

LACK OF TIME

FEAR

**BUYING PATTERNS  
BECAME**

UNEXPECTED

UNPRECEDENTED

UNPREDICTIBLE

## EMERGENCY SCENARIOS

UNCERTAINTY

SHORTAGE OF ITEMS

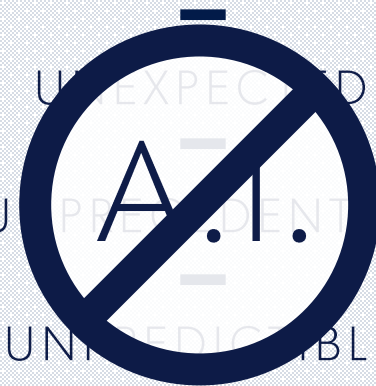
ECONOMIC PROBLEMS

LACK OF TIME

FEAR



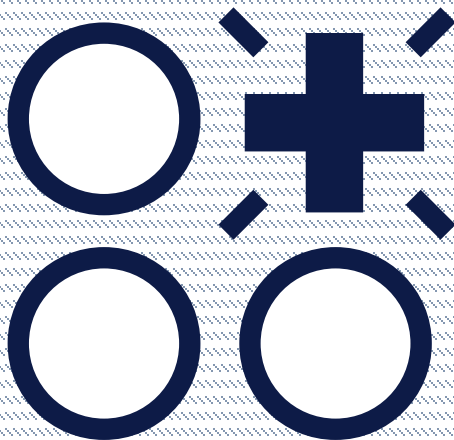
**BUYING PATTERNS  
BECAME**



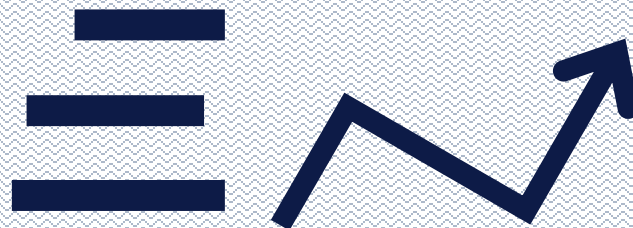
UNEXPECTED  
UNPRECEDENTED  
UNPREDICTABLE

## THE LOWEST COMMON DENOMINATOR

---

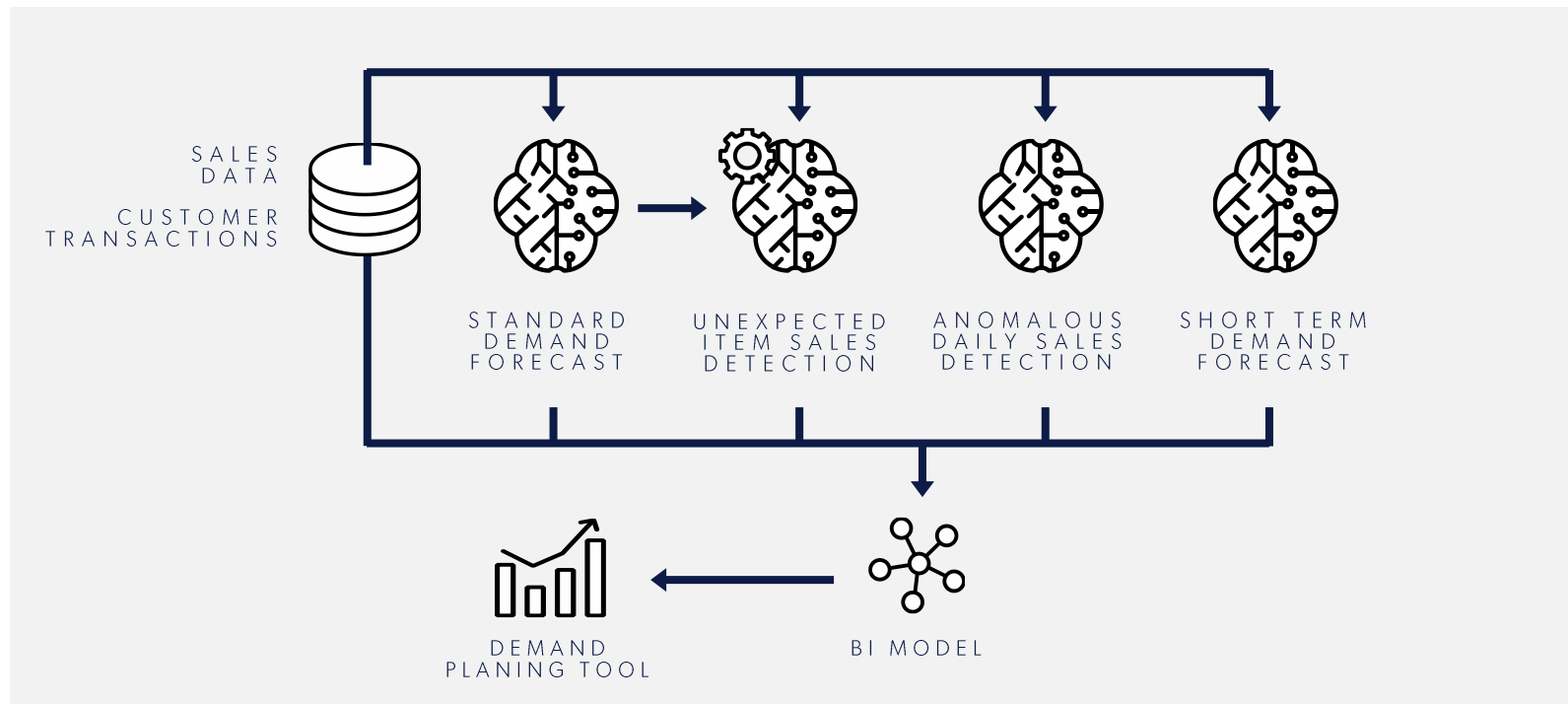


**DIFFERENT**



**SHORT AND  
FAST CHANGES**

## THE KEY INGREDIENTS





## TOOL FOR BUSINESS EXPERTS

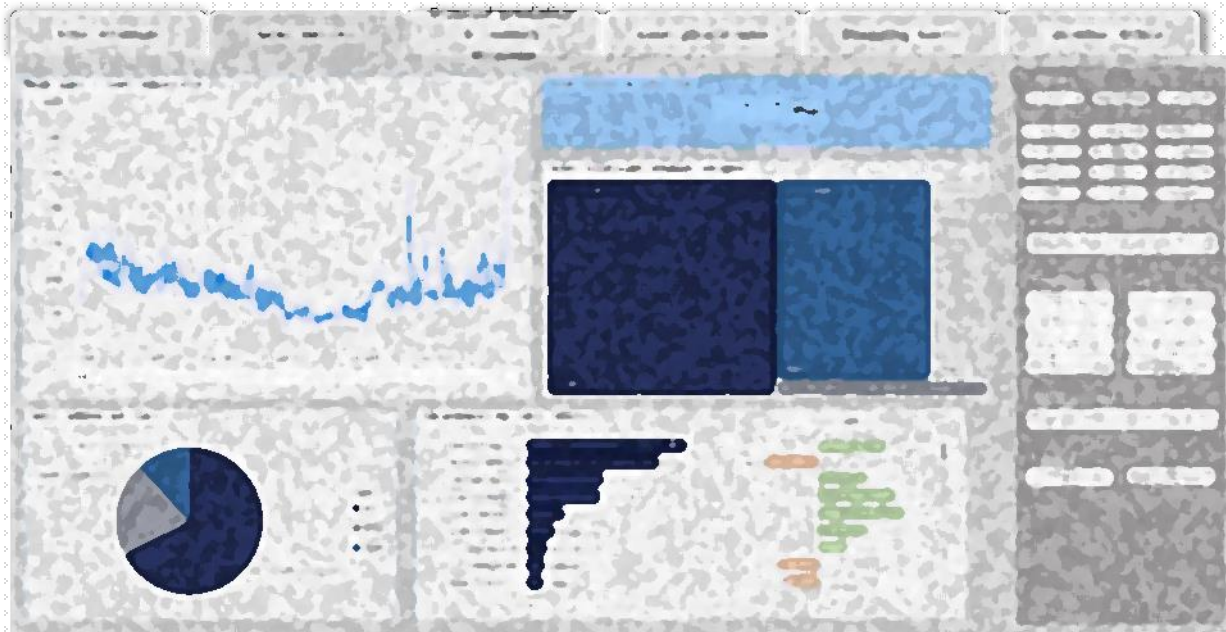
### SALES DESCRIPTIVE ANALYTICS

PAST TRENDS

KPI's EVOLUTION

NAVIGATE THROUGH  
TIME, PRODUCTS,  
STORES...

DAILY UPDATED DATA



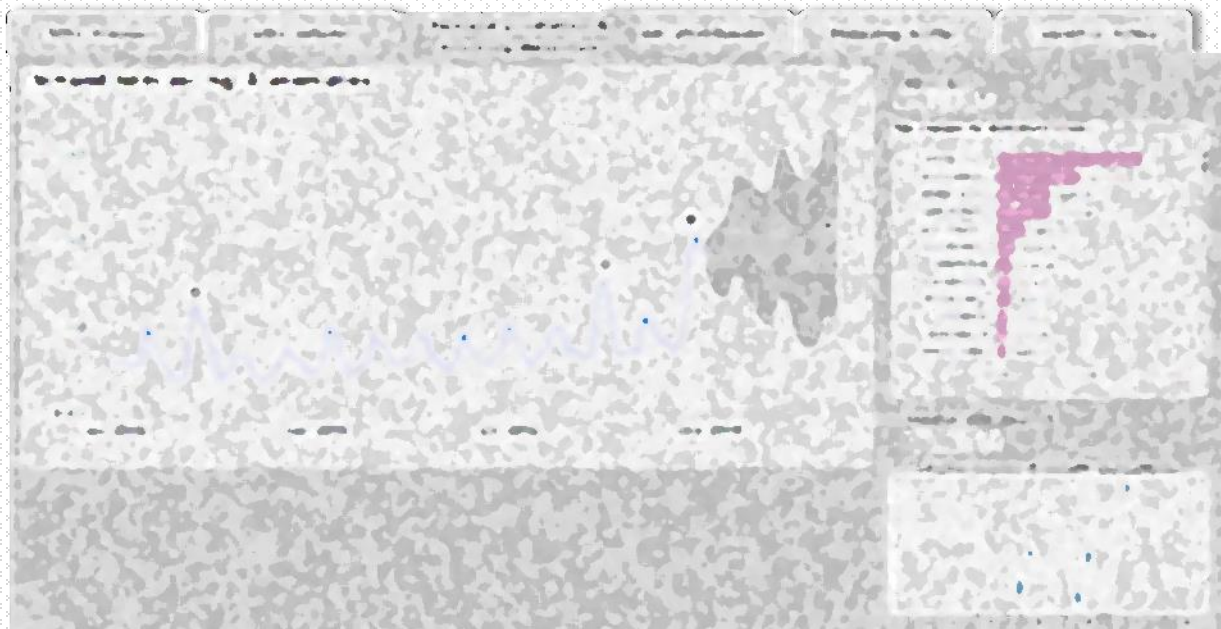
## TOOL FOR BUSINESS EXPERTS

### STANDARD DEMAND FORECAST

DAILY FORECAST

3 WEEKS AHEAD

PER ITEM AND STORE

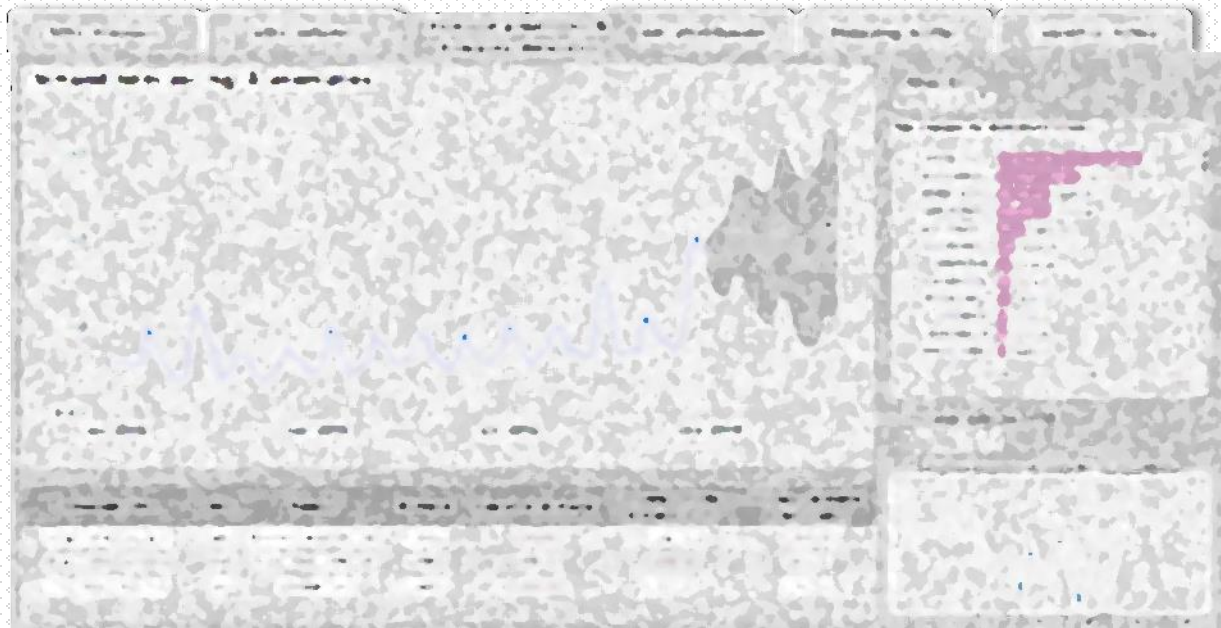


## TOOL FOR BUSINESS EXPERTS

### ANOMALOUS SALES DETECTION AND INSIGHTS

UNEXPECTED SALES  
PER ITEM AND STORE

QUICK RELATED  
INSIGHTS

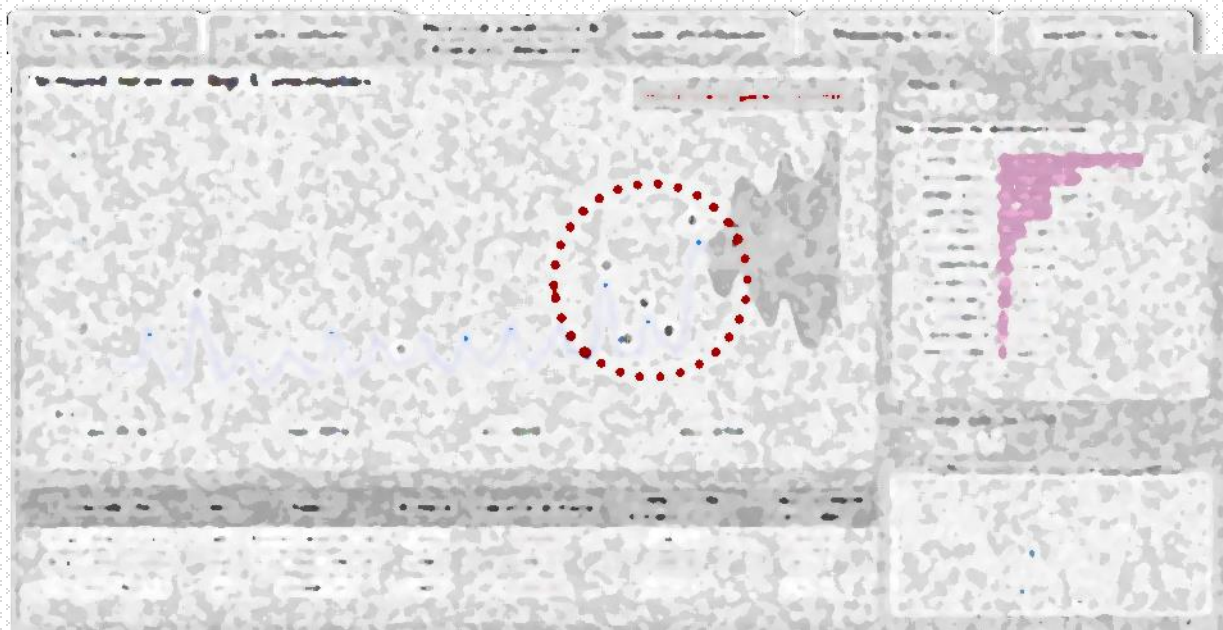


## TOOL FOR BUSINESS EXPERTS

### ANOMALOUS SALES DETECTION AND INSIGHTS

GLOBAL CHANGES  
PER DAY

REPEATED  
OCCURRENCES +  
SOCIAL CONTEX  
WILL BE THE KEY



## TOOL FOR BUSINESS EXPERTS

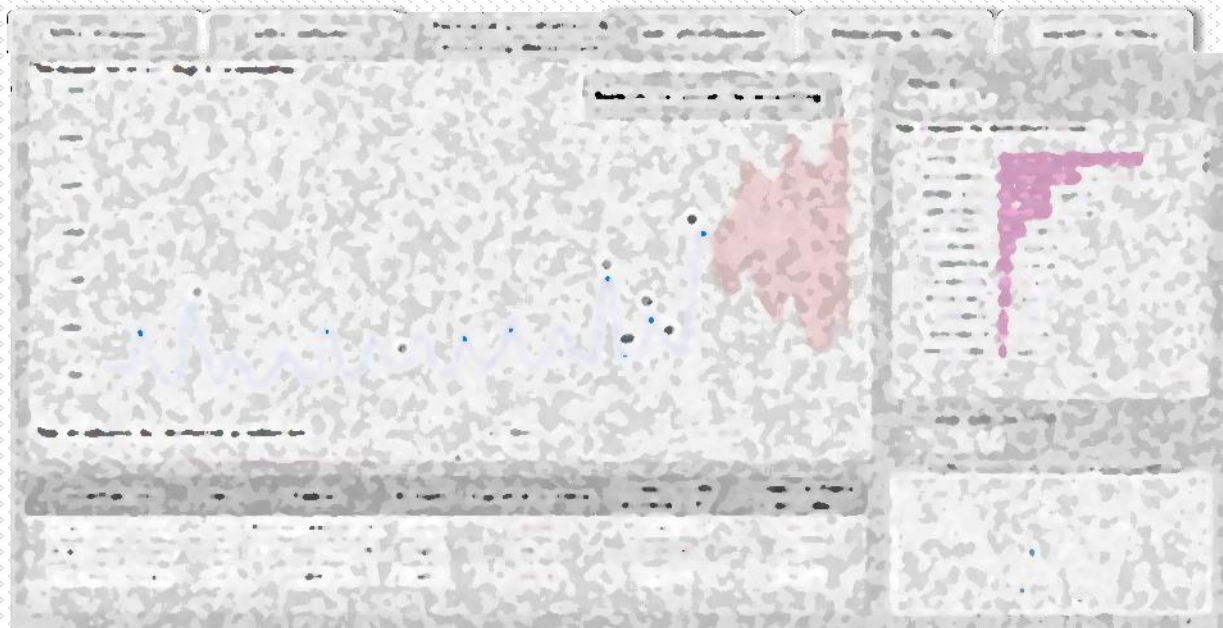
### EMERGENCY DEMAND FORECAST

BASED ON SHORT  
TERM CHANGES  
AND TRENDS

DAILY FORECAST

1 WEEKS AHEAD

PER ITEM AND  
STORE





## TOOL FOR BUSINESS EXPERTS

### STOCK ANALYSIS

STOCK vs FORECAST  
SUMMARY





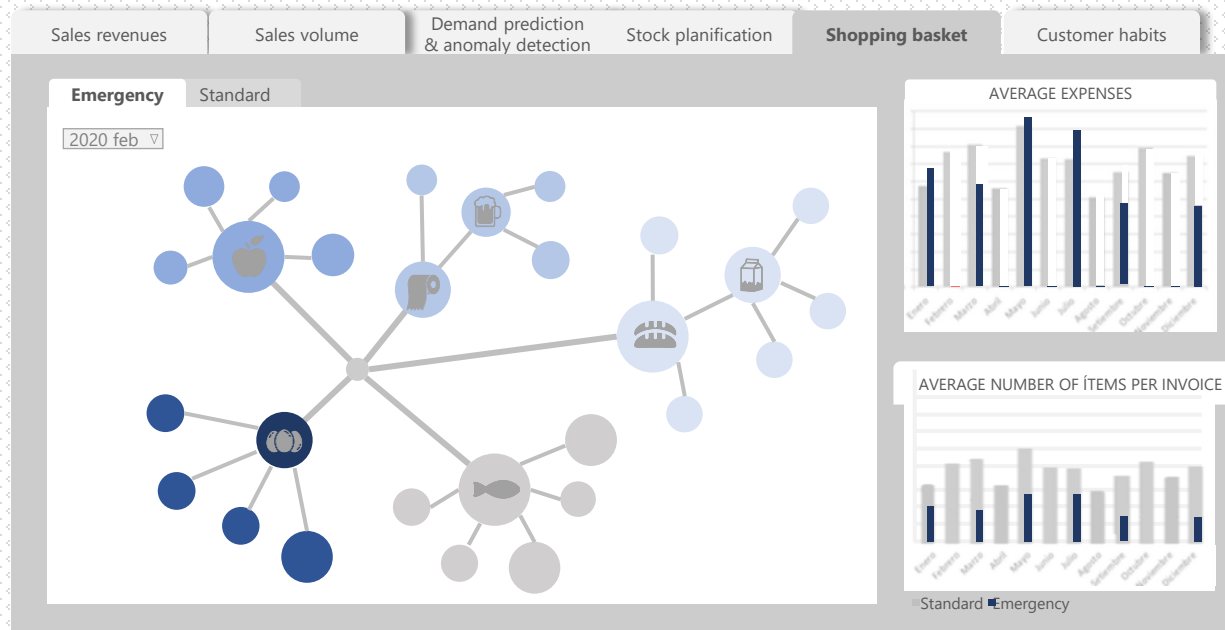
## TOOL FOR BUSINESS EXPERTS

### SHOPPING BASKET

#### BASKET ANALYSIS

DISCOVER BUYING  
PATTERNS CHANGES  
THROUGH TIME

STANDARD/EMERGENCY  
BUYING PATTERNS  
COMPARISON



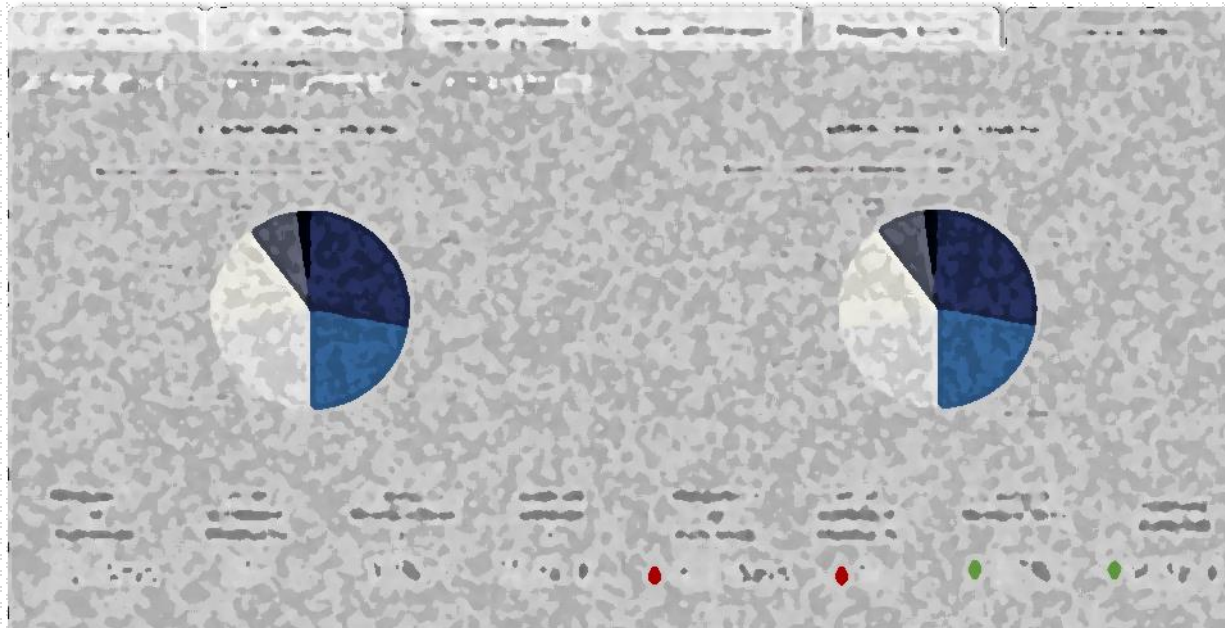
## TOOL FOR BUSINESS EXPERTS

### CUSTOMER HABITS

PRE-DEFINED CUSTOMER SEGMENTS PLACE IN THE SPOTLIGHT

STANDARD/EMERGENCY COMPARISON

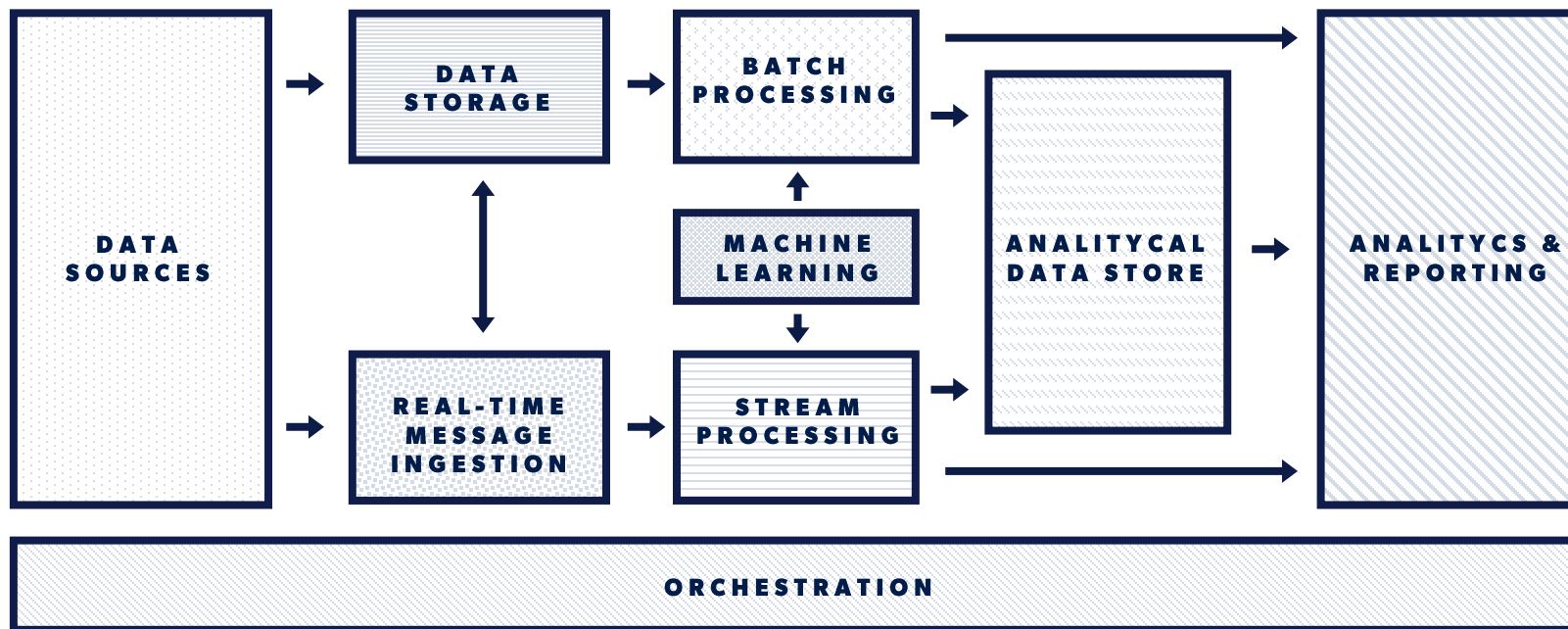
HOW YOUR WELL-KNOWN SEGMENTS BEHAVE WHEN THE WORLD CHANGES



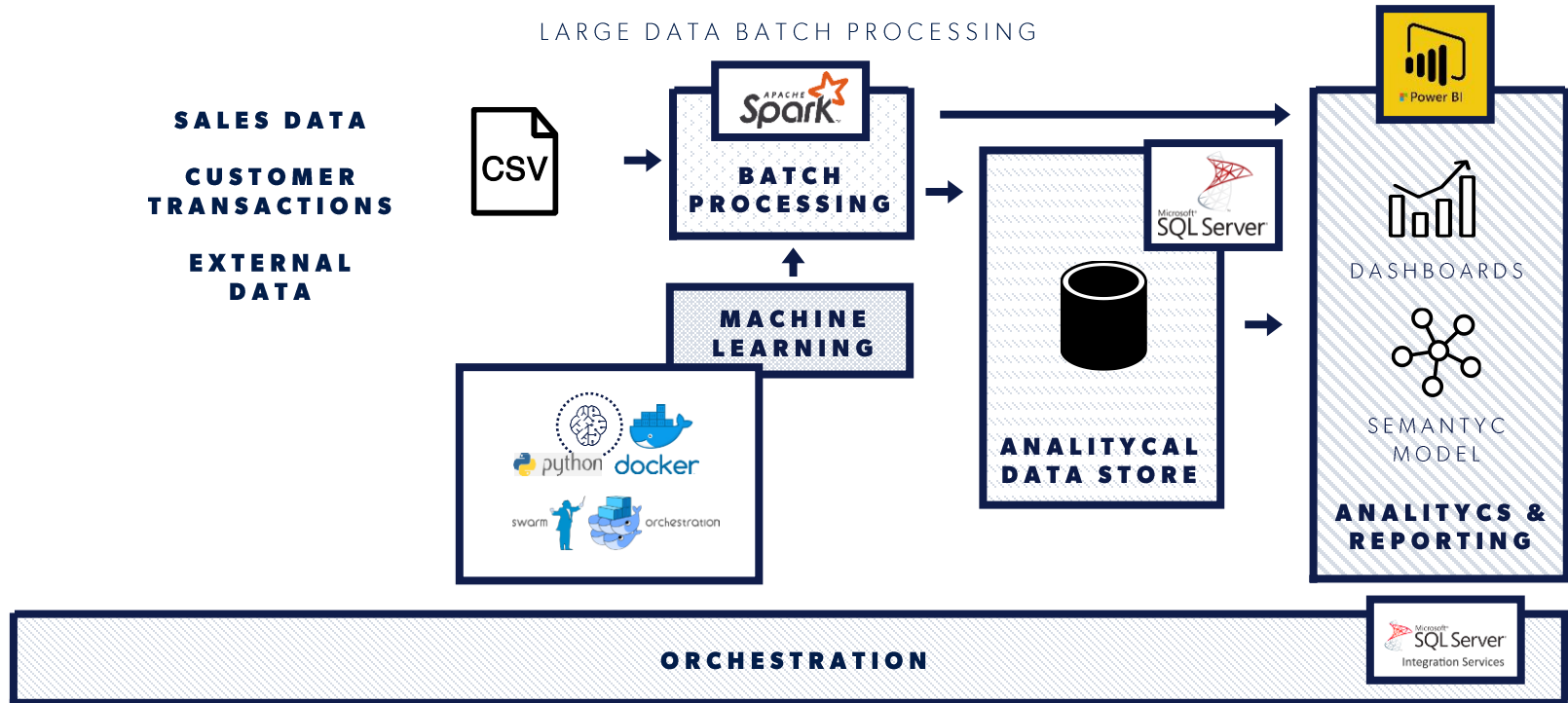
**02**  
—  
ALGORITHMS  
& TOOLS

## BIG DATA SOLUTION ARCHITECTURE

MODERN BIG DATA ARCHITECTURE (LAMBDA)



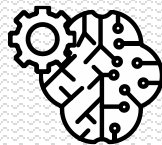
## BIG DATA SOLUTION ARCHITECTURE



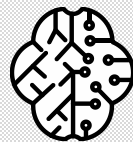
## ML MODELS TO BUILD



**STANDARD  
DEMAND  
FORECAST**



**UNEXPECTED  
ITEM SALES  
DETECTION**



**ANOMALOUS  
DAILY SALES  
DETECTION**



**SHORT TERM  
DEMAND  
FORECAST**



## ML MODELS TO BUILD



**STANDARD  
DEMAND  
FORECAST**



**UNEXPECTED  
ITEM SALES  
DETECTION**



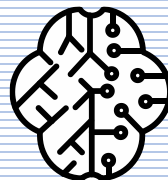
**ANOMALOUS  
DAILY SALES  
DETECTION**



**SHORT TERM  
DEMAND  
FORECAST**

### INPUT FEATURES

DAILY SALES STATISTICS  
PROMOS  
CALENDAR INFORMATION  
SHOP ID  
TIME LAGS



### OUTPUT

SALES VOLUME PER  
DAY, ITEM AND STORE

## ML MODELS TO BUILD



**STANDARD  
DEMAND  
FORECAST**



**UNEXPECTED  
ITEM SALES  
DETECTION**



**ANOMALOUS  
DAILY SALES  
DETECTION**



**SHORT TERM  
DEMAND  
FORECAST**

**PyCARET**

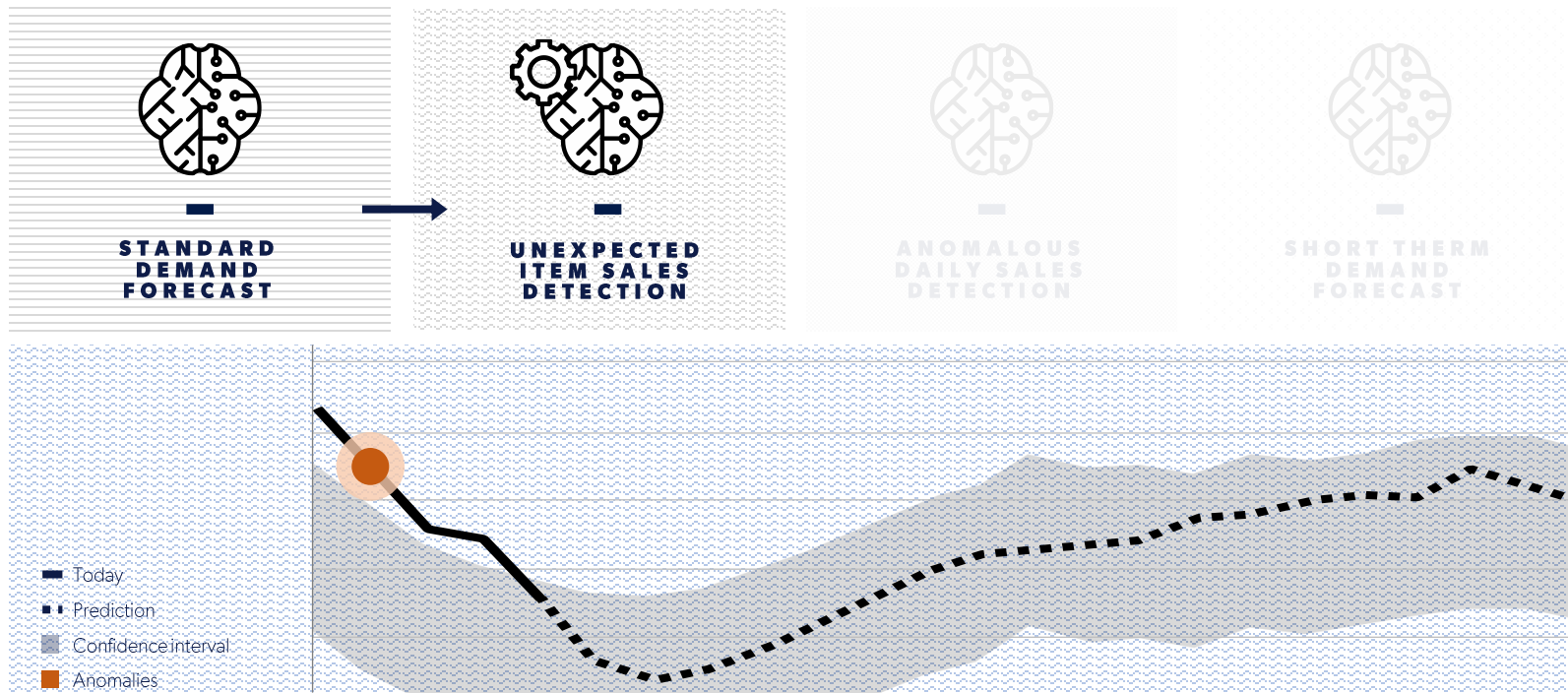
  
**RANDOM  
FOREST**

 **LightGBM**

*dmlc*  
**XGBoost**

 **CatBoost**

## ML MODELS TO BUILD



## ML MODELS TO BUILD



STANDARD  
DEMAND  
FORECAST



UNEXPECTED  
ITEM SALES  
DETECTION



ANOMALOUS  
DAILY SALES  
DETECTION



SHORT TERM  
DEMAND  
FORECAST

### IFOREST

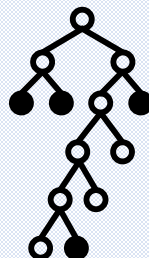
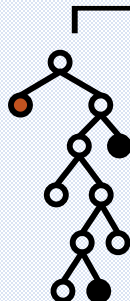
#### Outlier

Normal uncommon  
samples

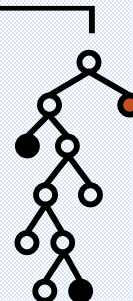
Normal common  
samples

0.5

#### SCORES



... ..



#### ITREE

## ML MODELS TO BUILD



STANDARD  
DEMAND  
FORECAST



UNEXPECTED  
ITEM SALES  
DETECTION



ANOMALOUS  
DAILY SALES  
DETECTION



SHORT TERM  
DEMAND  
FORECAST

### INPUT FEATURES

DAILY SALES SHORT TERM STATISTICS

PROMOS

AVAILABLE STOCK

ANOMALIES OCCURRENCE

SHOP ID

SHORT TERM TIME LAGS



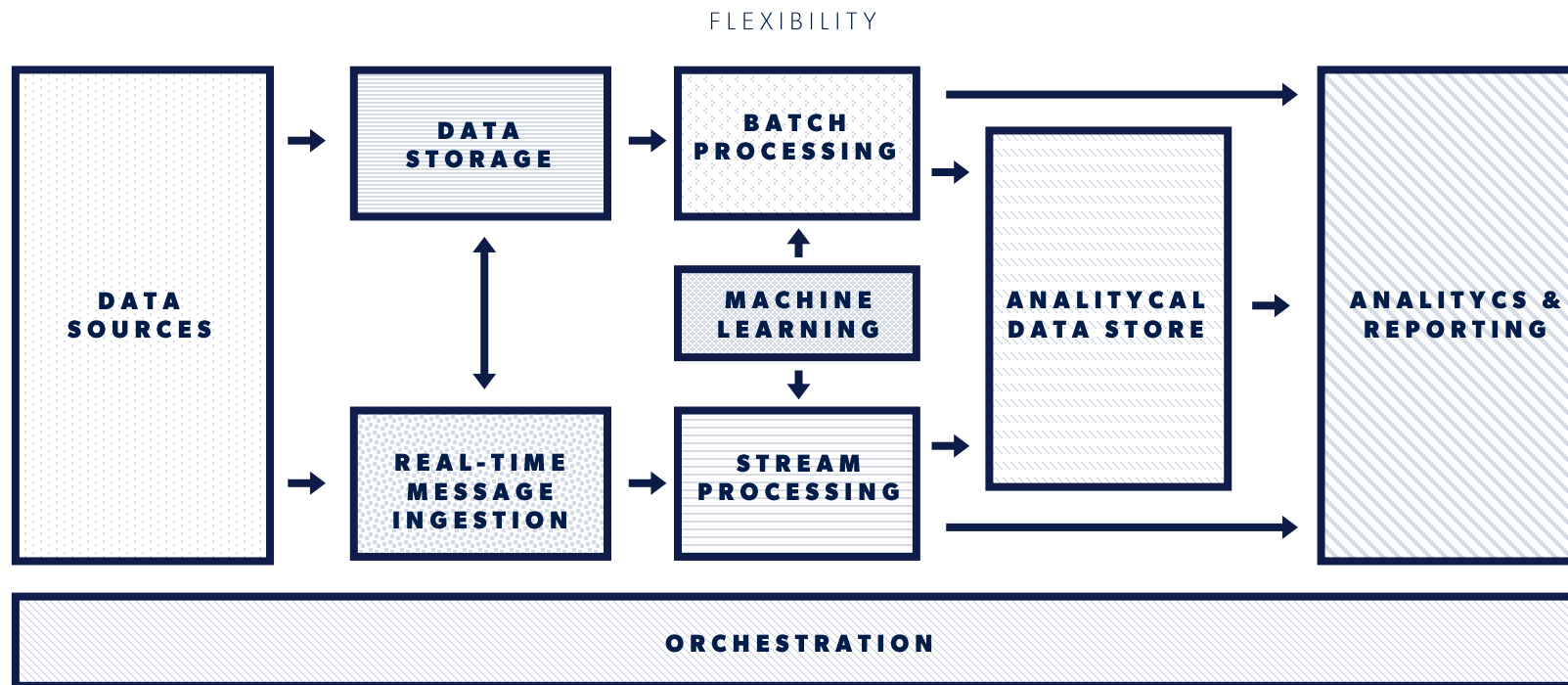
### OUTPUT

SALES VOLUME PER  
DAY, ITEM AND STORE

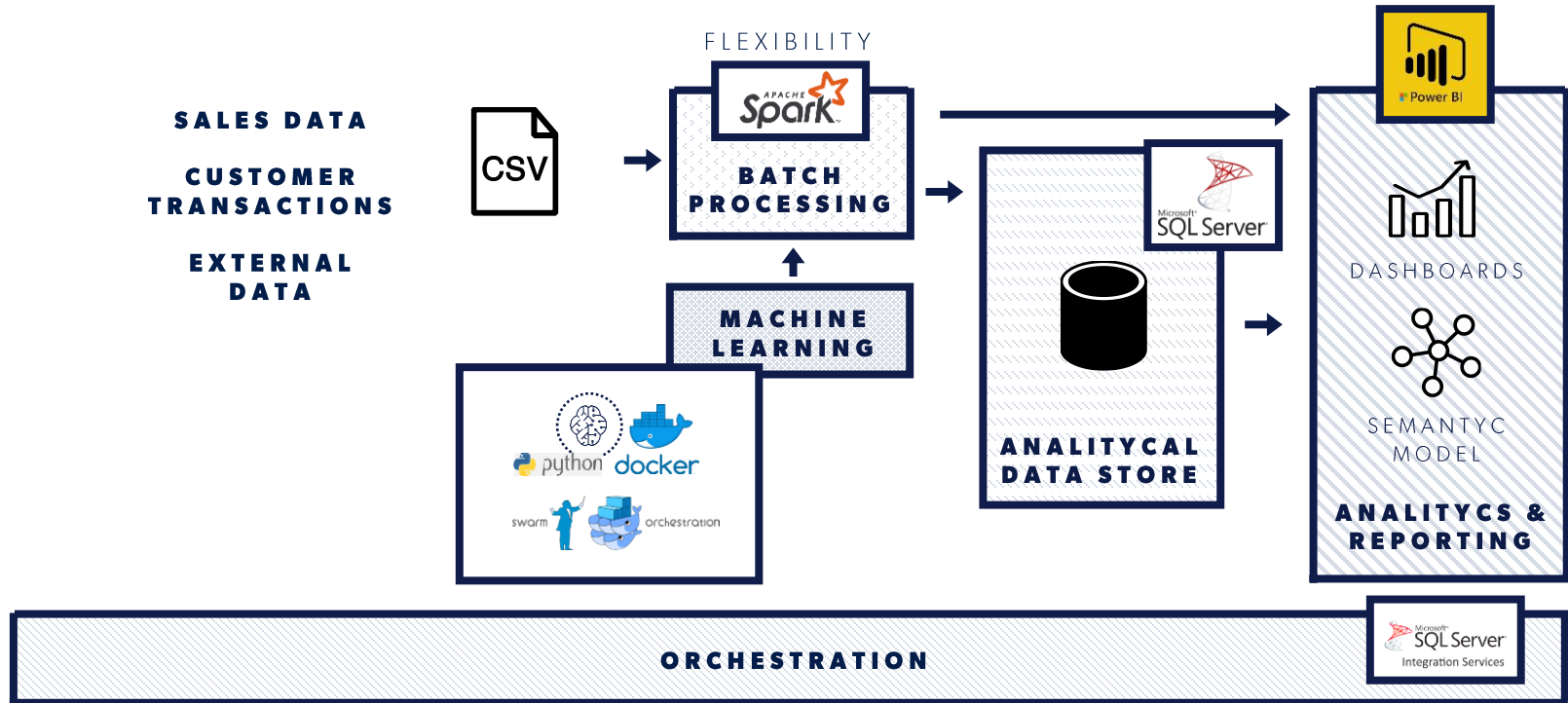
**03**  
—  
**SCALABILITY  
& FLEXIBILITY**



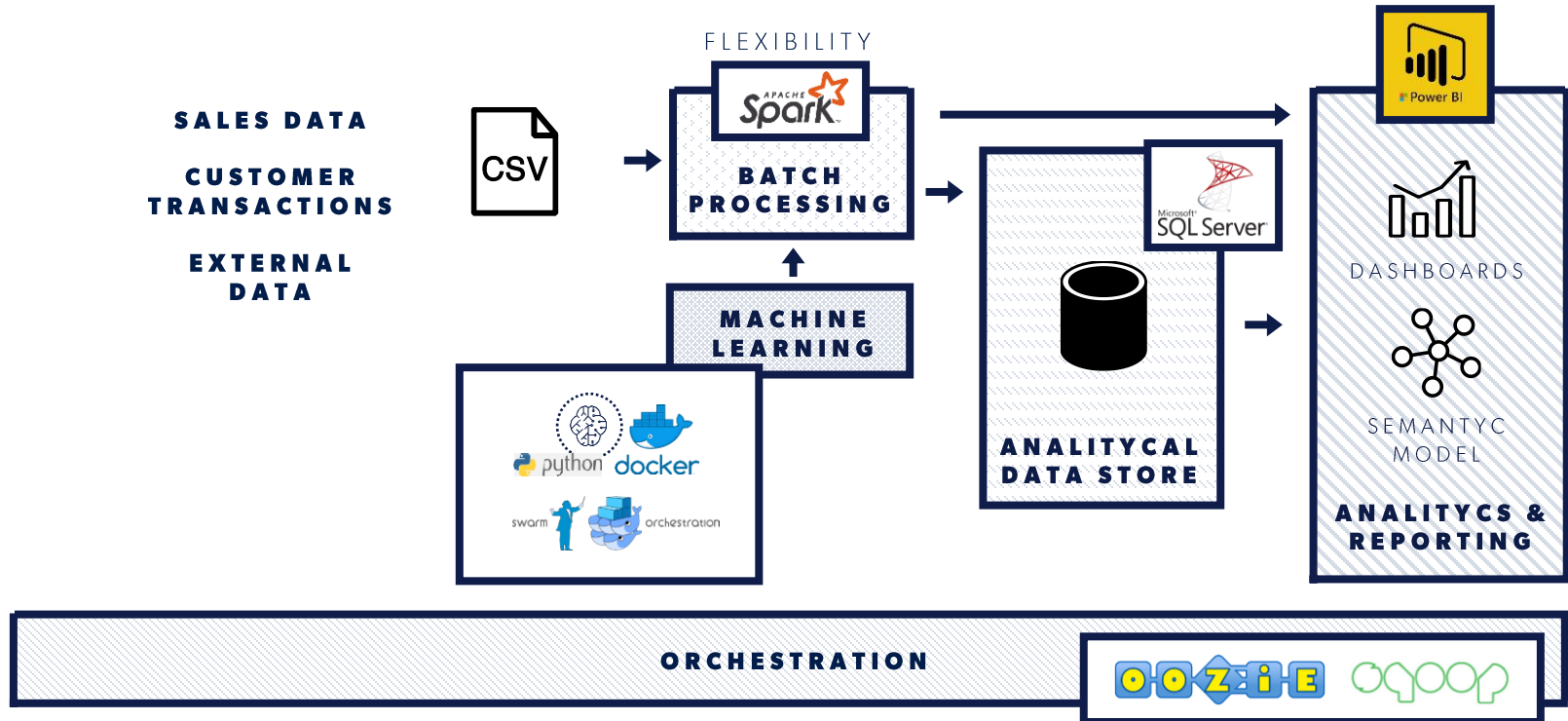
## BIG DATA SOLUTION ARCHITECTURE



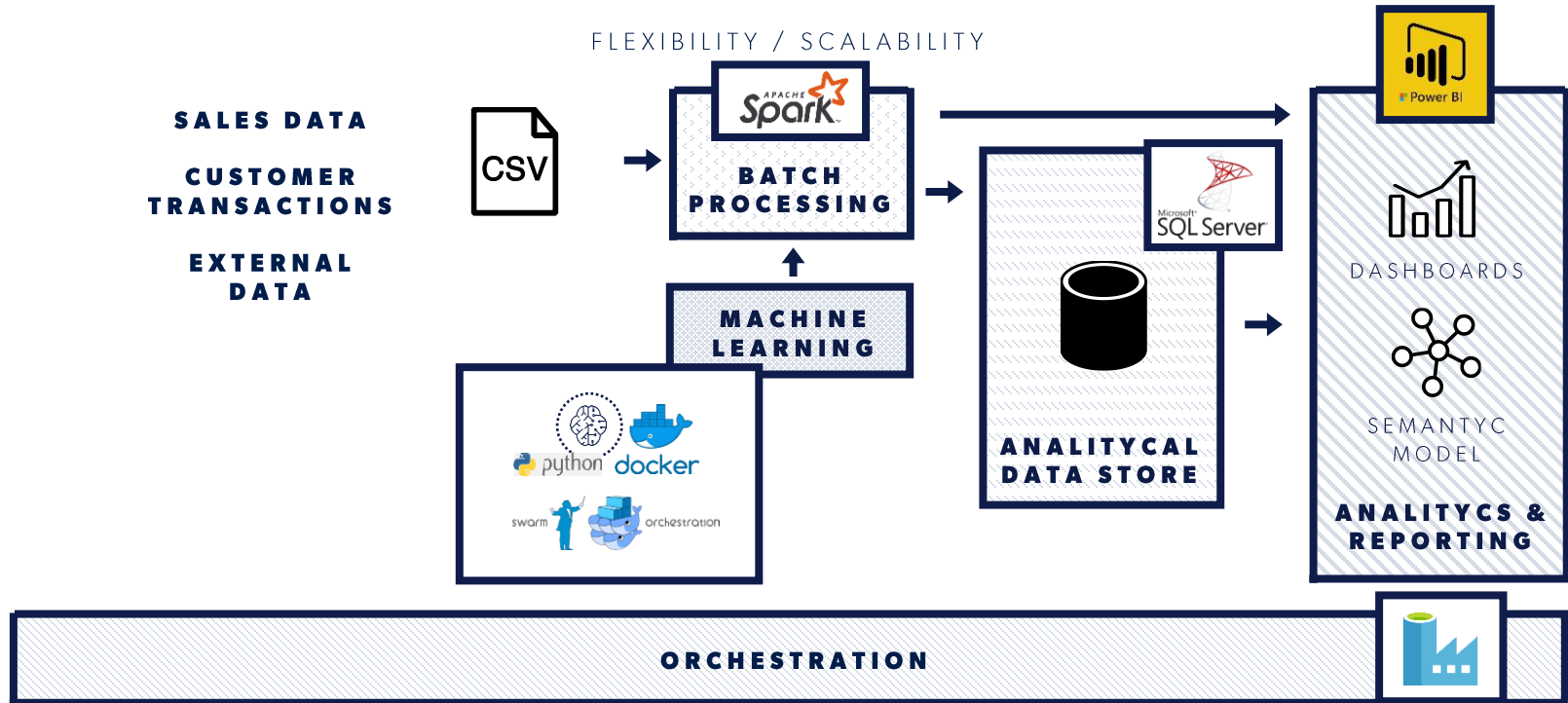
## BIG DATA SOLUTION ARCHITECTURE



## BIG DATA SOLUTION ARCHITECTURE



## BIG DATA SOLUTION ARCHITECTURE



**04**

—

# DATA GOVERNANCE & LEGAL COMPLIANCE

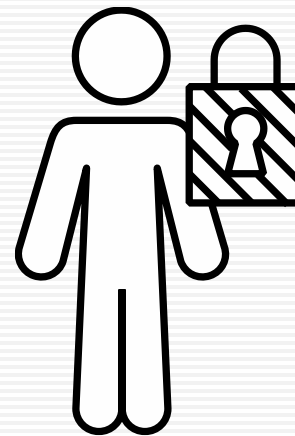
## DATA GOVERNANCE & LEGAL COMPLIANCE

---



**ON PREMISE**

**CLOUD**



**PRIVACY**  
NO ETHICAL  
ISSUES EXPECTED

**05**

—

# RISK MANAGEMENT QUALITY ASSURANCE

**RISK MANAGEMENT  
& QUALITY ASSURANCE**

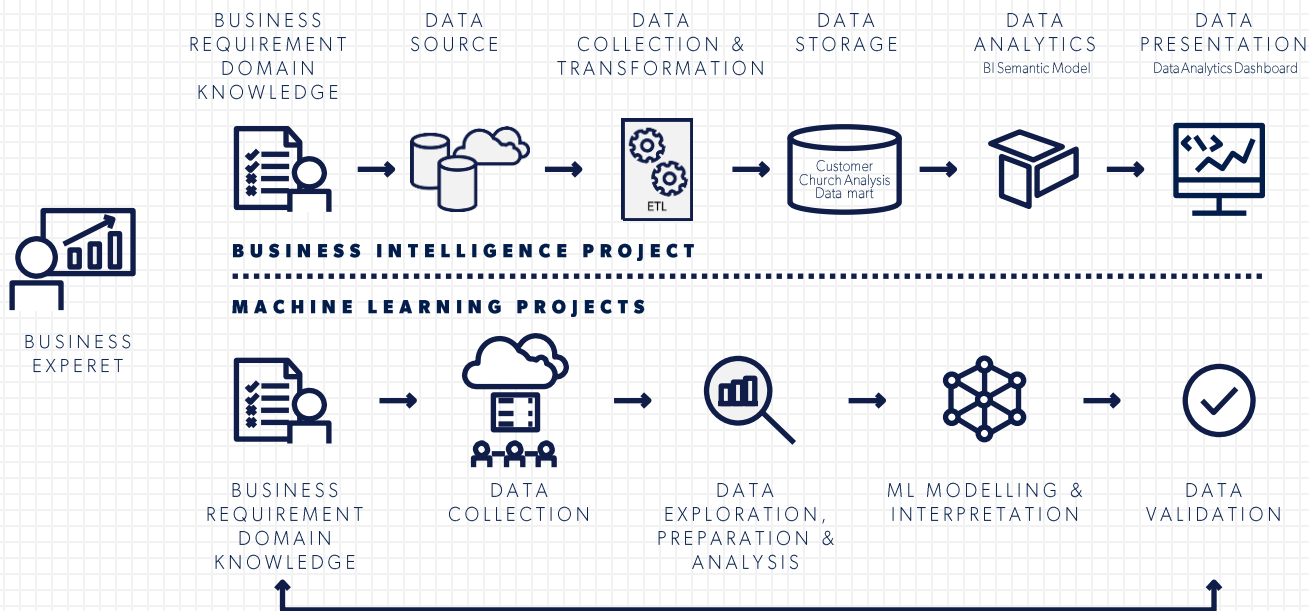


**01.**  
COMPLEXITY



## DIVIDE AND CONQUER

### TWO MAIN LINES OF DEVELOPMENT

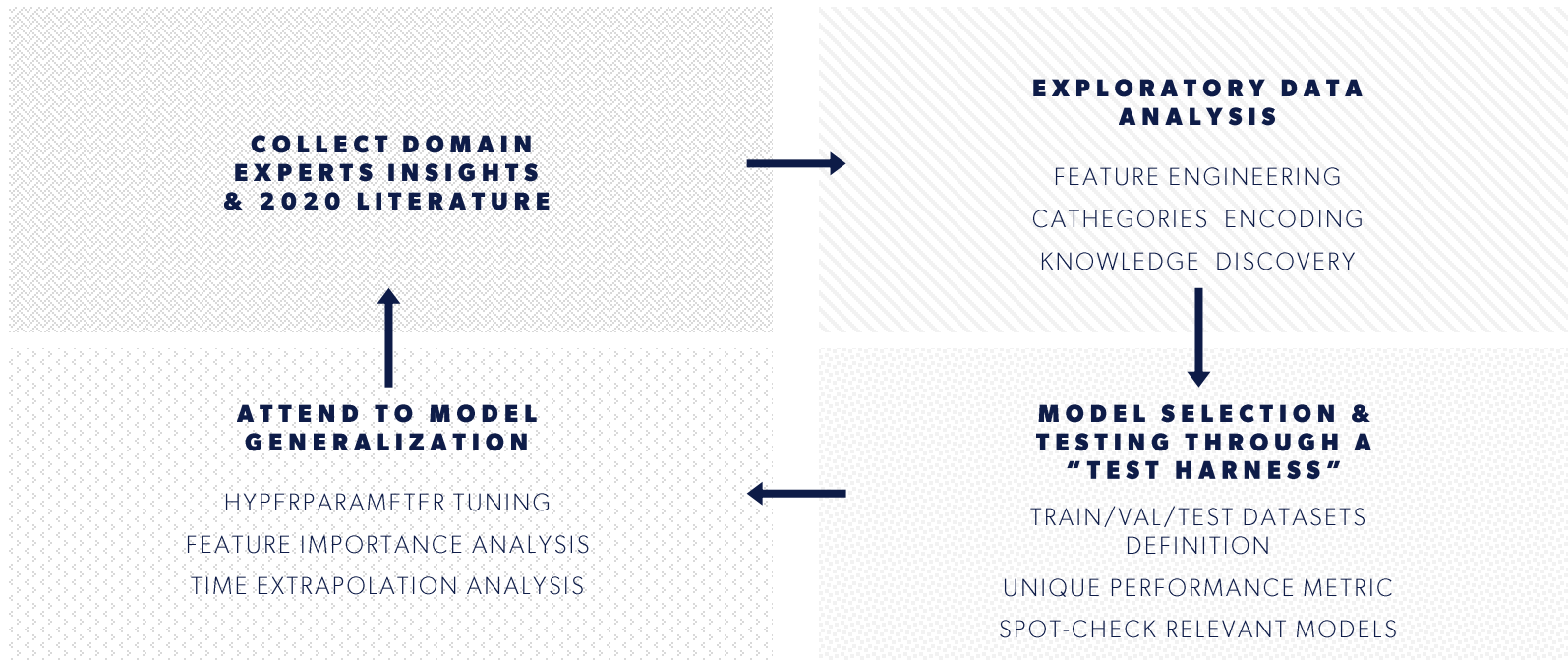


**RISK MANAGEMENT  
& QUALITY ASSURANCE**



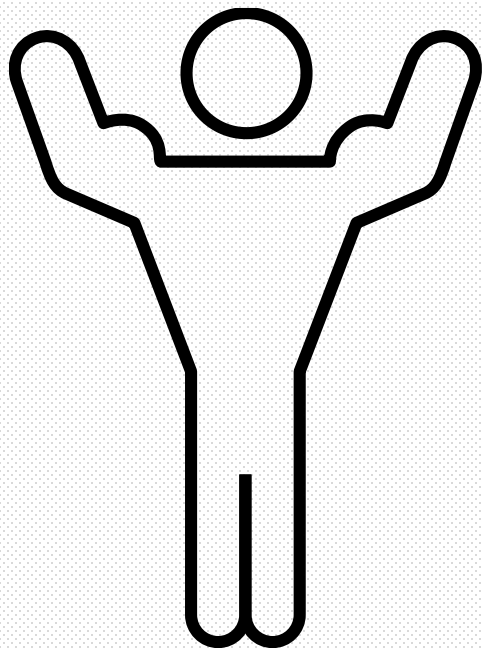
**02.**  
FAST TRENDS  
FORECAST

## RISK MANAGEMENT & QUALITY ASSURANCE



**06**  
—  
...TO  
**SUM UP**

## **A TOOL TO OFFER RELEVANT INFORMATION & STANDARD FORECAST**



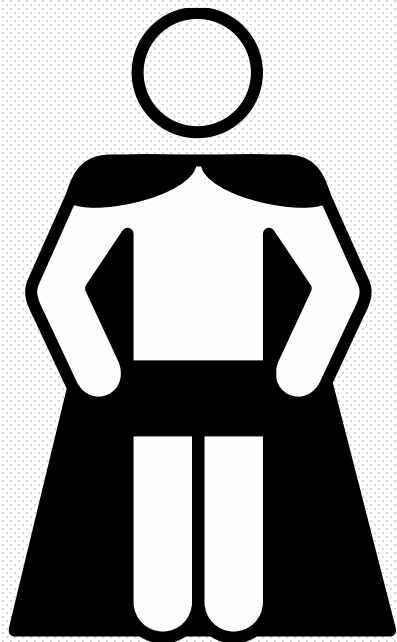
DETAILED AND  
ACCURATE DATA

EASY TO USE TOOLS  
TO GET INSIGHTS

TREND ANALYSIS  
AND STANDARD FORECAST

## ... AND GIVE THEM NEW SUPER POWERS

---



DETAILED AND  
ACCURATE DATA

---

EASY TO USE TOOLS  
TO GET INSIGHTS

---

TREND ANALYSIS  
AND STANDARD FORECAST

---

IDENTIFY ANOMALIES

---

FAST TREND FORECAST

THANK YOU!  
Q&A

—  
CYC

