

RECOMMENDATION ENGINES

MASTER IN BUSINESS ANALYTICS AND BIG DATA

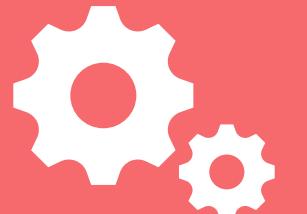
STRANDS CLO CASE SOLVING RETAILER & CUSTOMER NEEDS

How can I get my customers to spend more?

Where can I find offers that are relevant to me?



CLO

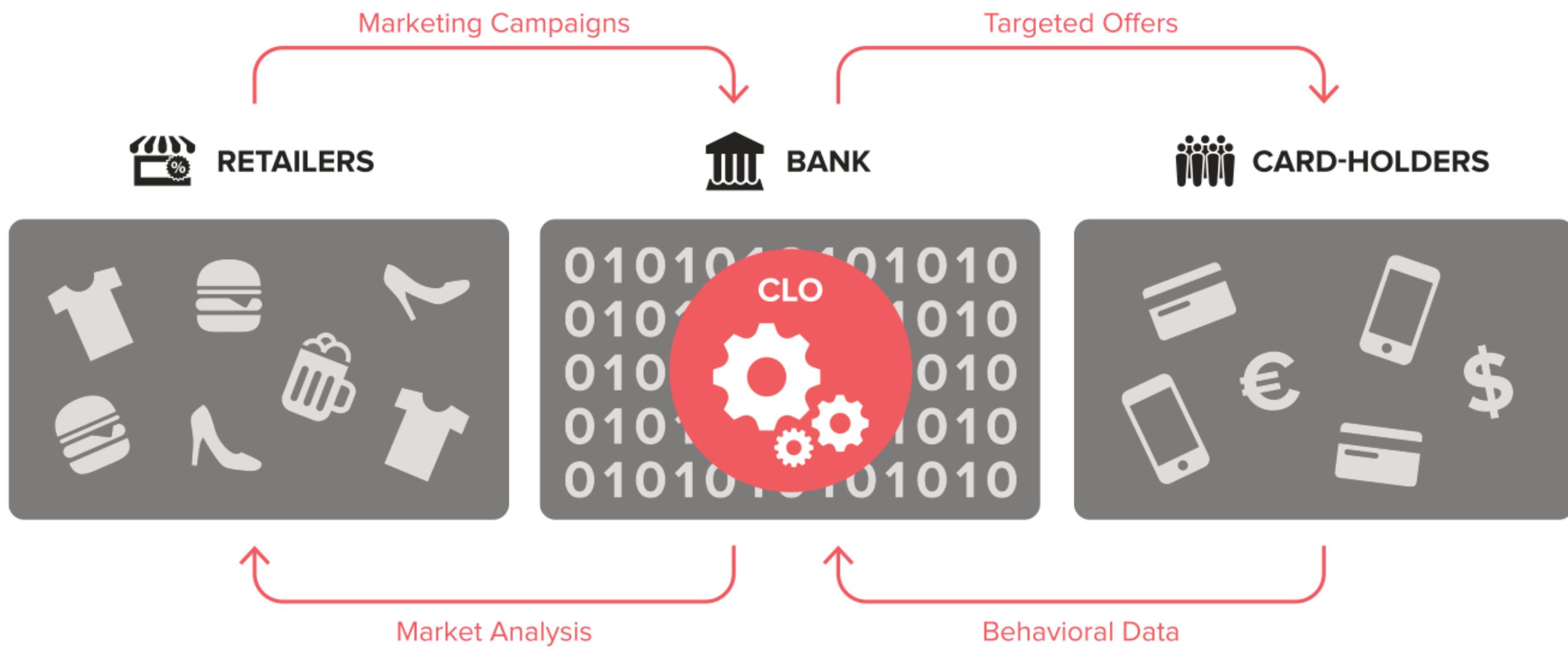


How can I attract new customers?

Help! There are so many offers, which one to pick?

A WHITE-LABEL MARKETING TOOL FOR BANKS

Retailers can target highly relevant deals to card-holders through digital banking channels



RETAILER PERSPECTIVE



1. Create a campaign



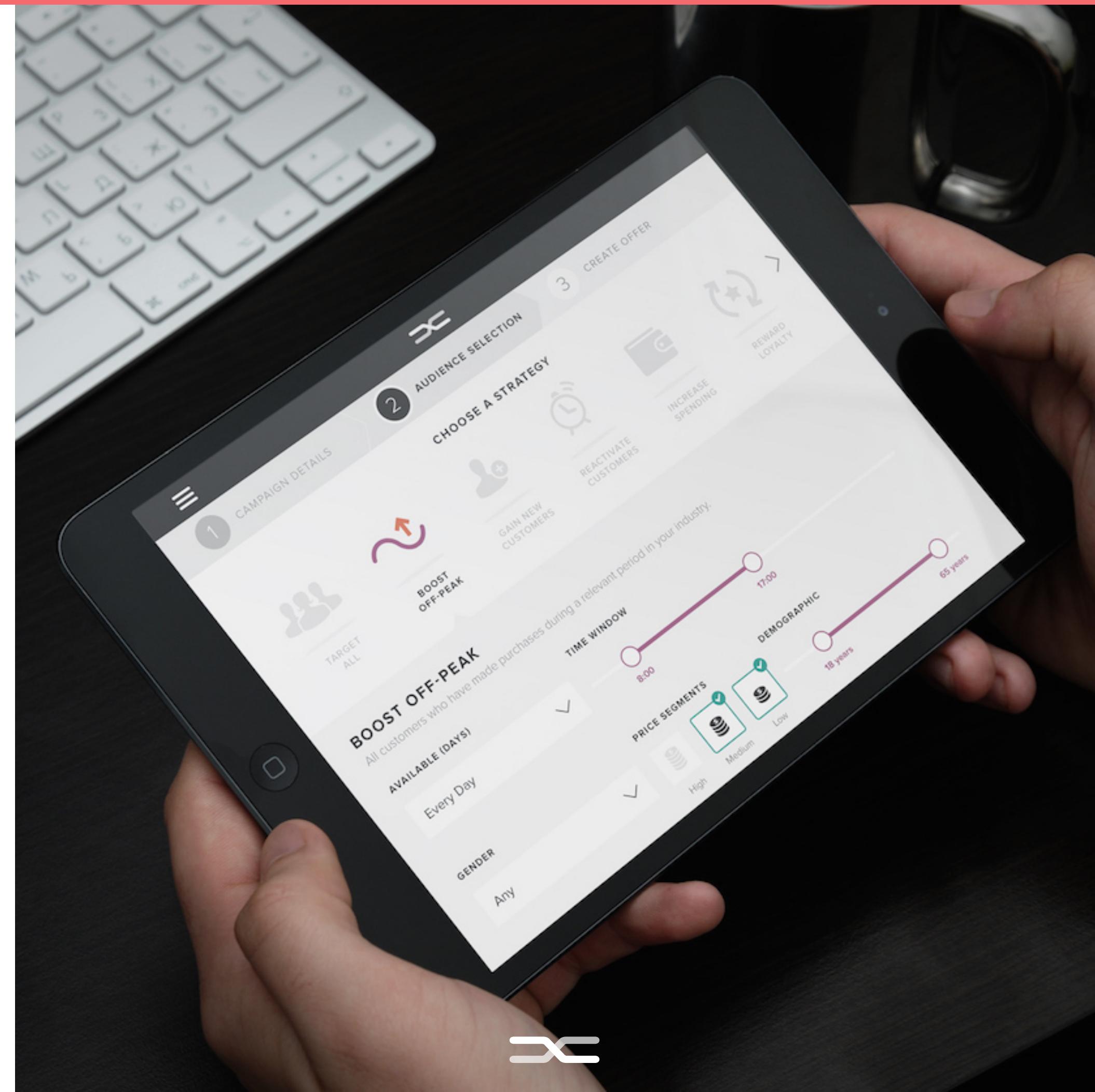
2. Publish and monitor results



3. Sell



4. Get charged by the bank



CARD-HOLDER PERSPECTIVE

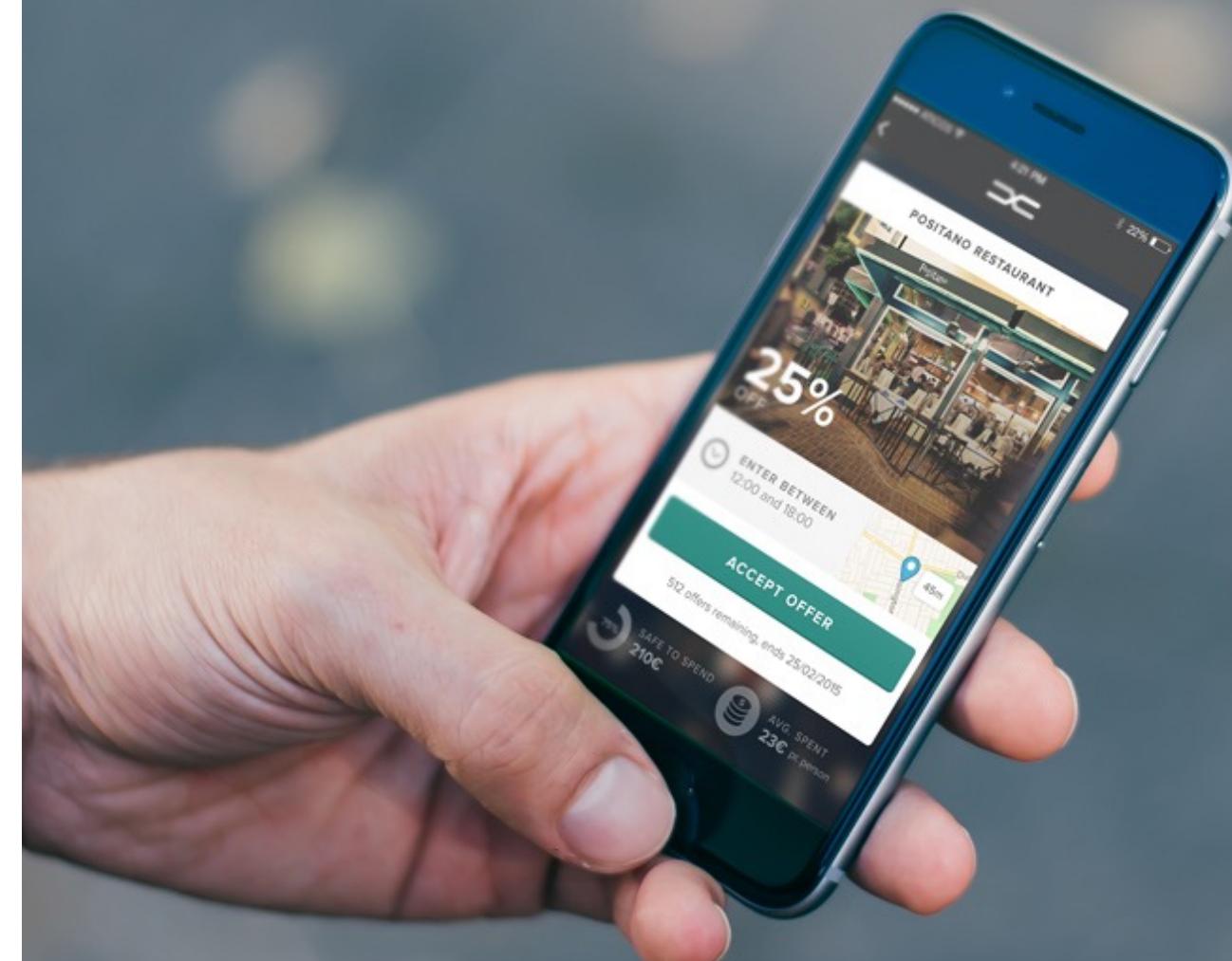


1. Accept an offer within mobile or online banking

2. Shop at the retailer

3. Pay with bank card or mobile wallet

4. Receive cash back in bank account



THE CHALLENGE

I'm tired of receiving offers I don't need. I want to get discounts for what **I am really looking for**



It is hard to sustain the growth of my business. I want to **target the right customers** with discounts



How to **maximize** the overall **performance** for all offers?



OVERALL SALIENCE

To optimize overall system efficiency: determine the right balance between campaign **success** and **relevance**

CAMPAIGN SUCCESS

Select the right campaigns to maximize **success** across all.

Depends on Time Ratio (TR) & Campaign Accomplishment Ration (AR).



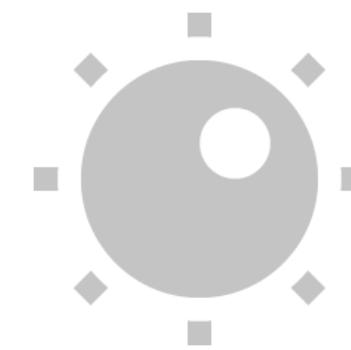
CAMPAIGN RELEVANCE

Match campaigns with the right customers to maximize **relevance**. Depends on a combination of behavioral features and demographic filters.

CAMPAIGN SUCCESS

Success is measured by the accomplishment of the campaign over time. Accomplishment is measured by number of offers redeemed.

TIME RATIO (TR)

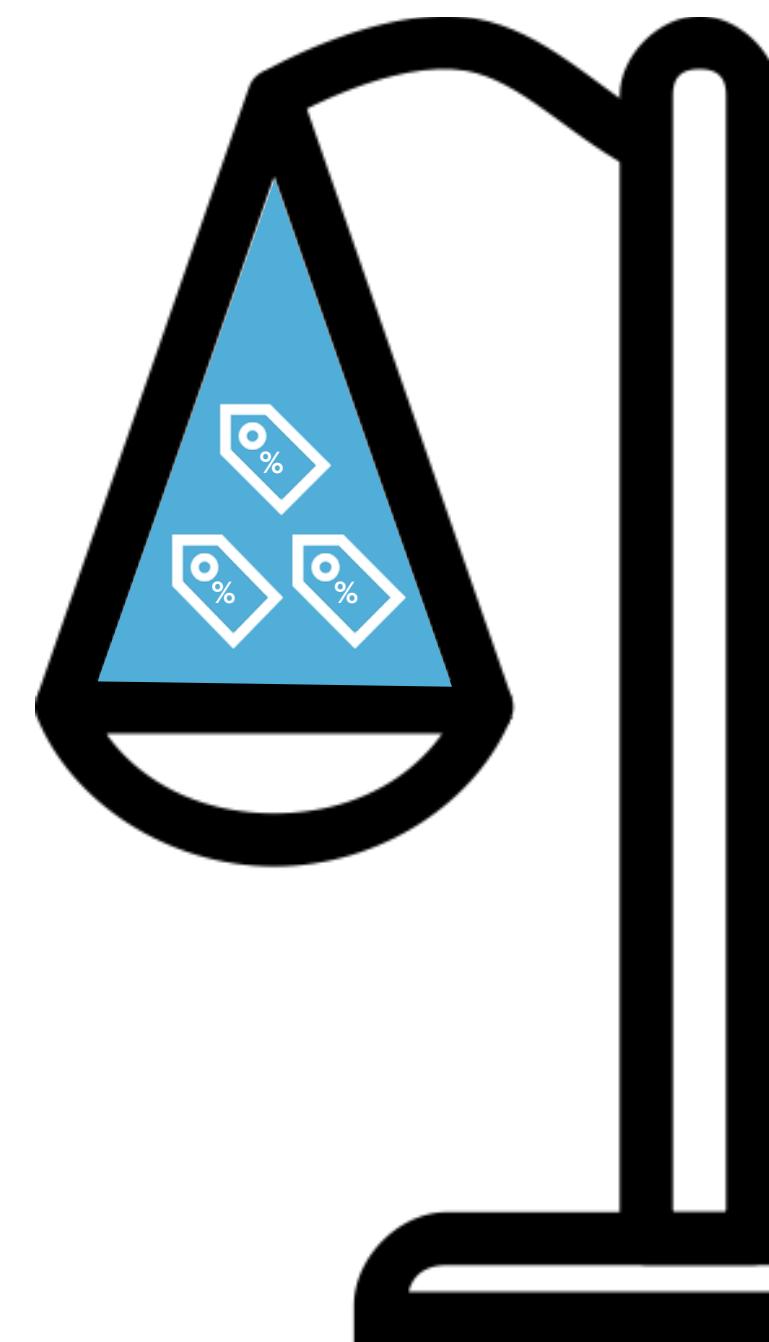


Time remaining
to finish the
campaign

ACCOMPLISHMENT RATIO (AR)

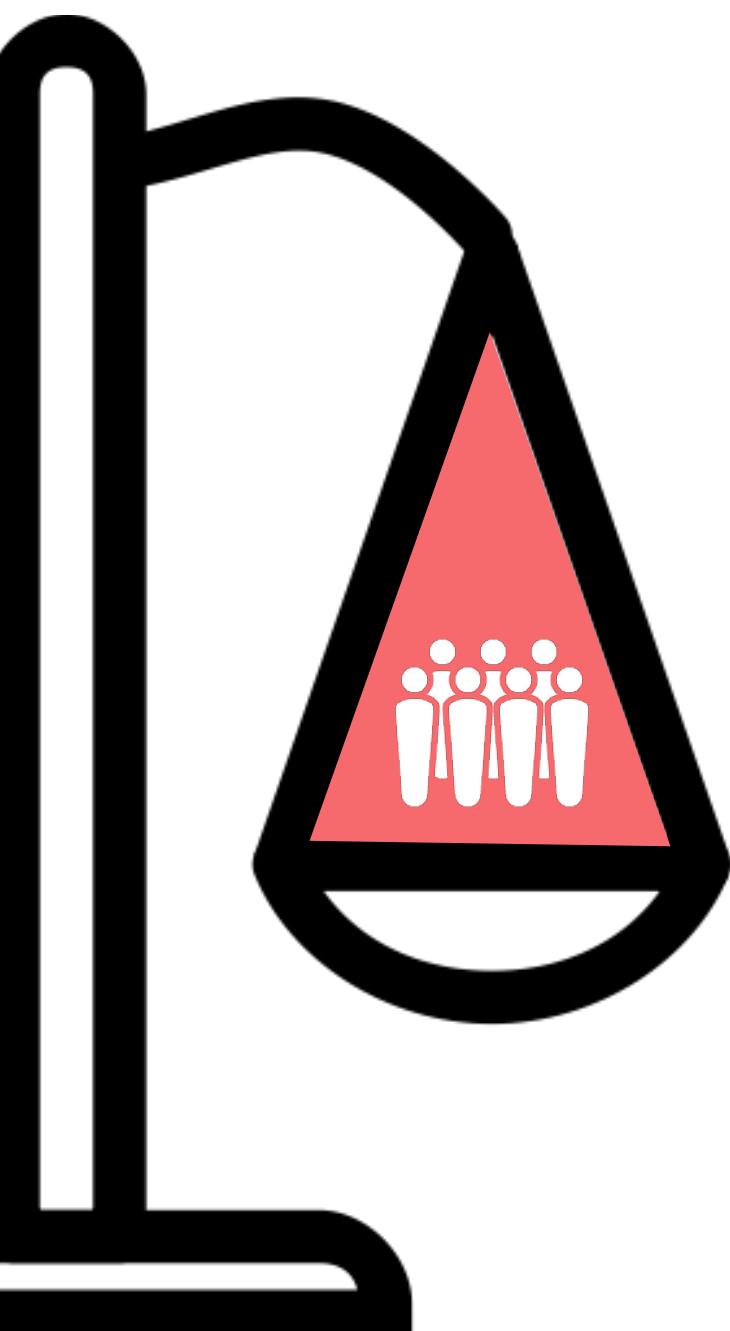


Number of offers
redeemed from the
total number of offers

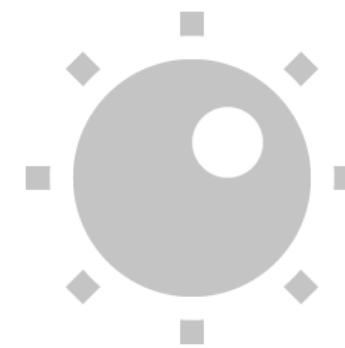


CAMPAIGN RELEVANCE

Relevance is measured by offer acceptance. A linear combination of features predict this, and the bank can fine-tune each:



LIKELIHOOD



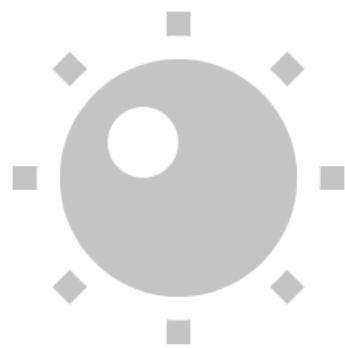
Predicted probability of the customer to buy in the merchant industry during the campaign period

PROXIMITY



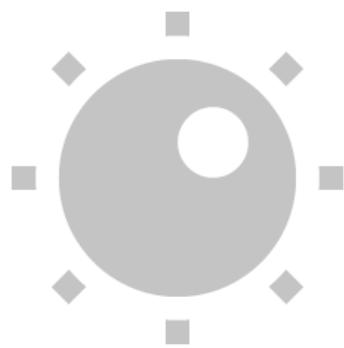
Distance between where customer buys, lives and where campaign merchant's stores are located

ACTIVITY



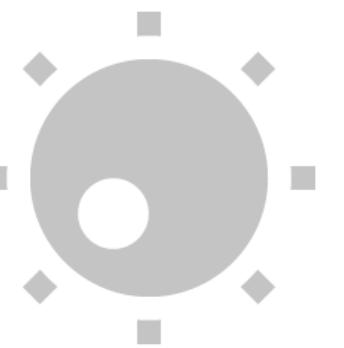
How much business the customer is making with the merchant compared with the rest of merchant's customers

LOYALTY



Ratio of customer activity and fitness with the merchant compared to the industry

FITNESS



How close the median of the customer transaction amounts is to the median of merchant transaction amounts



FORMULA

$$UOS(u_j, o_i) = \omega_1 LK(u_j, o_i, \tau(o_i)) + \omega_2 PX(u_j, m(o_i)) + \omega_3 ACT(u_j, m(o_i)) + \omega_4 LY(u_j, m(o_i)) + \omega_5 MF(u_j, m(o_i))$$



$$Salience(u_j, o_i) = \alpha_3 UOS(u_j, o_i) + (1 - \alpha_3) OS(o_i)$$



User value
+
Business value

$$OS(o_i) = TR(o_i) - AR(o_i)$$

$$TR(o_i) = \frac{today - startDate(o_i)}{endDate - startDate(o_i)}$$

$$AR(o_i) = \frac{redemptionsActual(o_i)}{redemptionsTarget(o_i)}$$



ALGORITHMS (MACHINE LEARNING)

SUPERVISED LEARNING

- › BASELINE (RMSE: 0.3810)
- › LINEAR REGRESSION (RMSE: 0.3783)
- › LOGISTIC REGRESSION (RMSE: 0.3787)
- › DECISION TREE (RMSE: 0.3793)
- › **RANDOM FOREST (RMSE: 0.3337)**

LIKELIHOOD
(PURCHASE PREDICTION)

UNSUPERVISED LEARNING

- › **K-MEANS** (ELBOW METHOD K=3 OK)

ACTIVITY

LOYALTY

FITNESS



PURCHASE PREDICTION

Supervised Learning

Regression problem

Random Forest

Seasonality (12 Months)

Customers (Millions)

Industries (Hundreds)

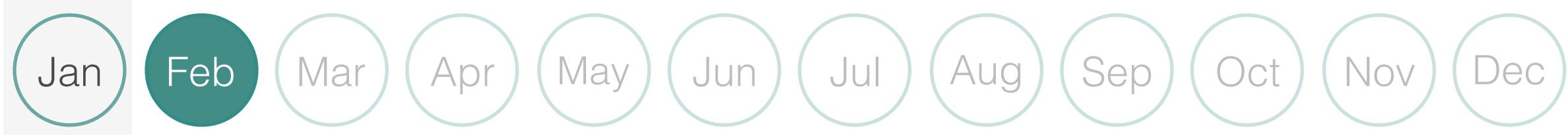
2 YEARS OF DATA



Training Set



Hypothesis $h_{\theta}(x)$



MONTH TO PREDICT

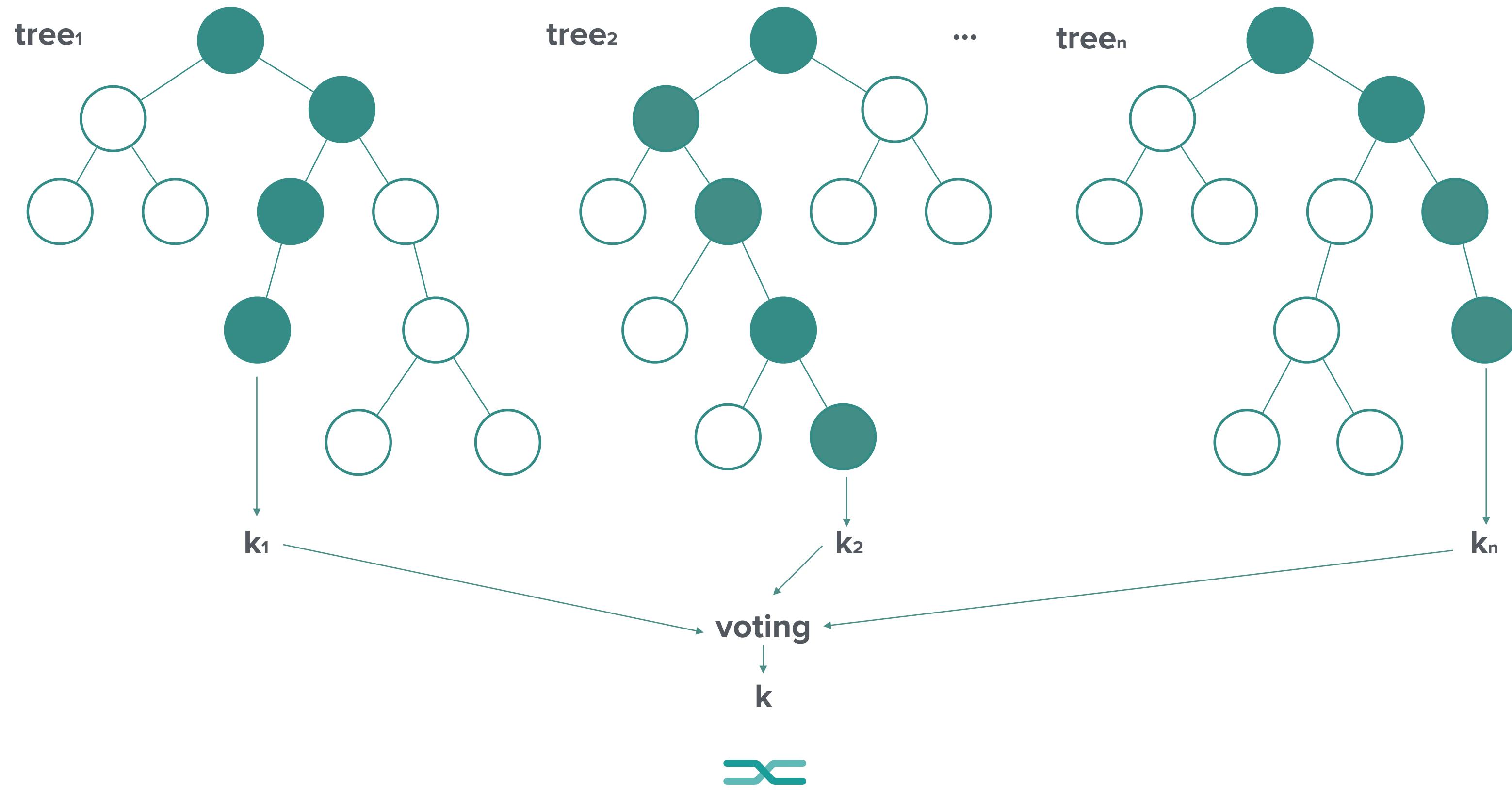


PURCHASE PREDICTION

12 Months

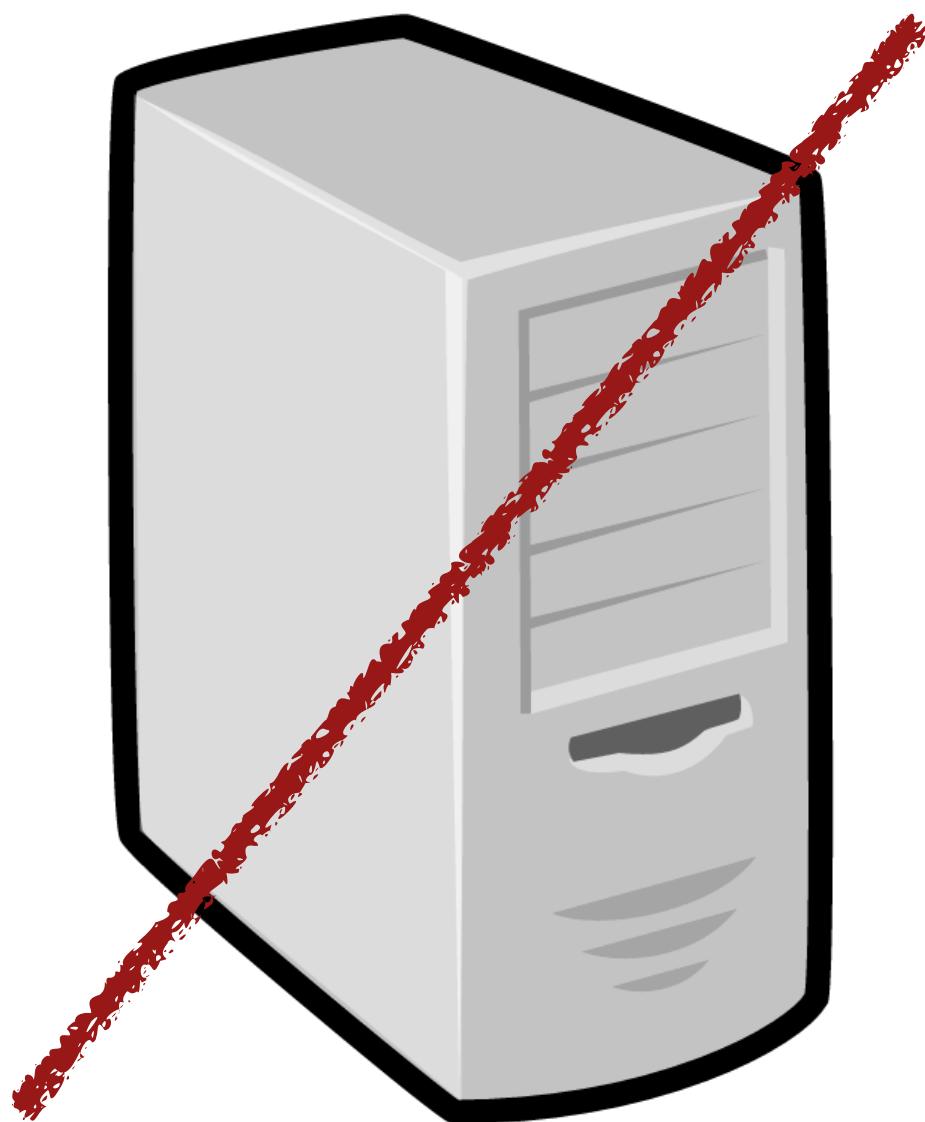
Month Transactions

Month Amount

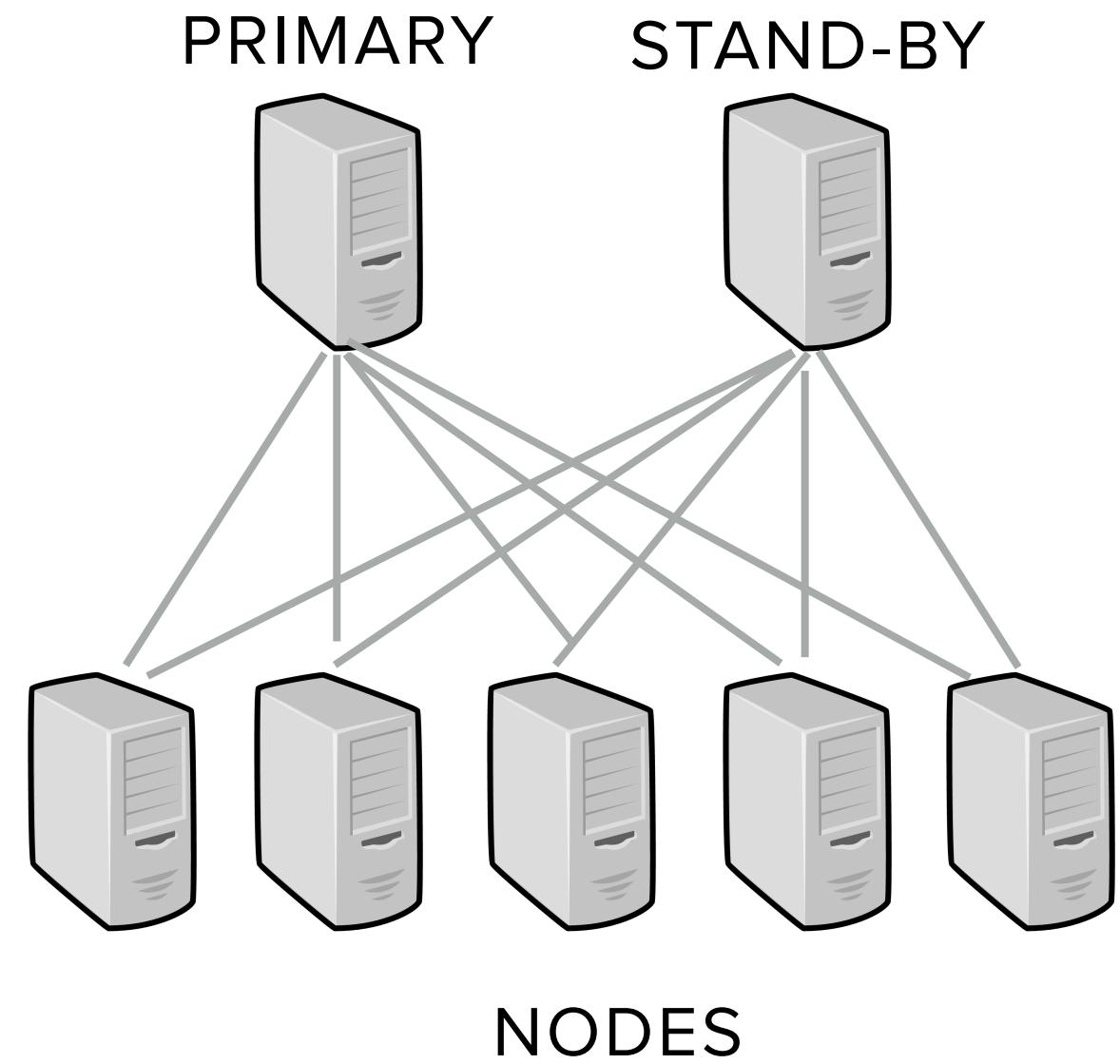


SCALABILITY

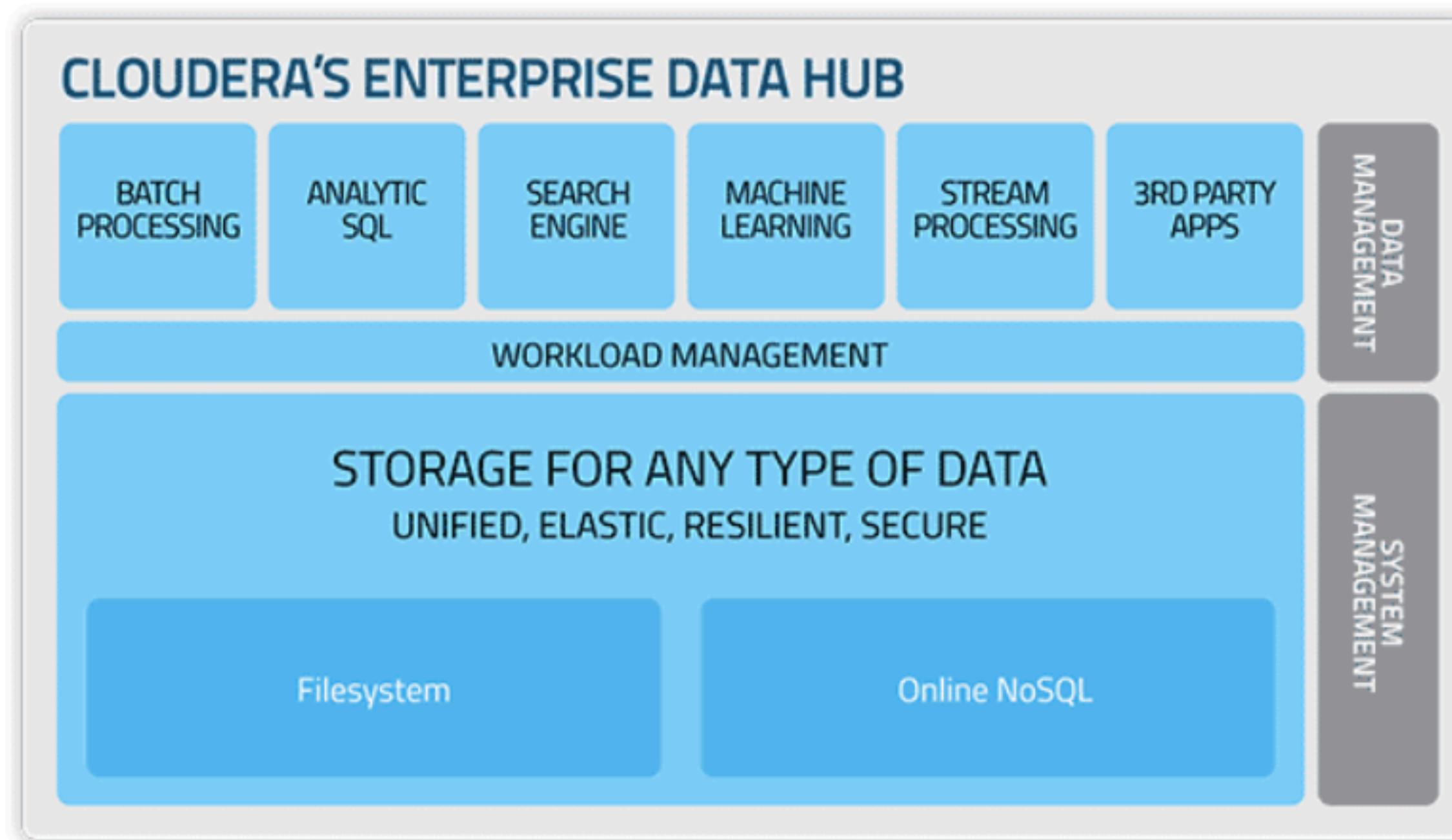
VERTICAL
(EXPENSIVE - “EASIER”)



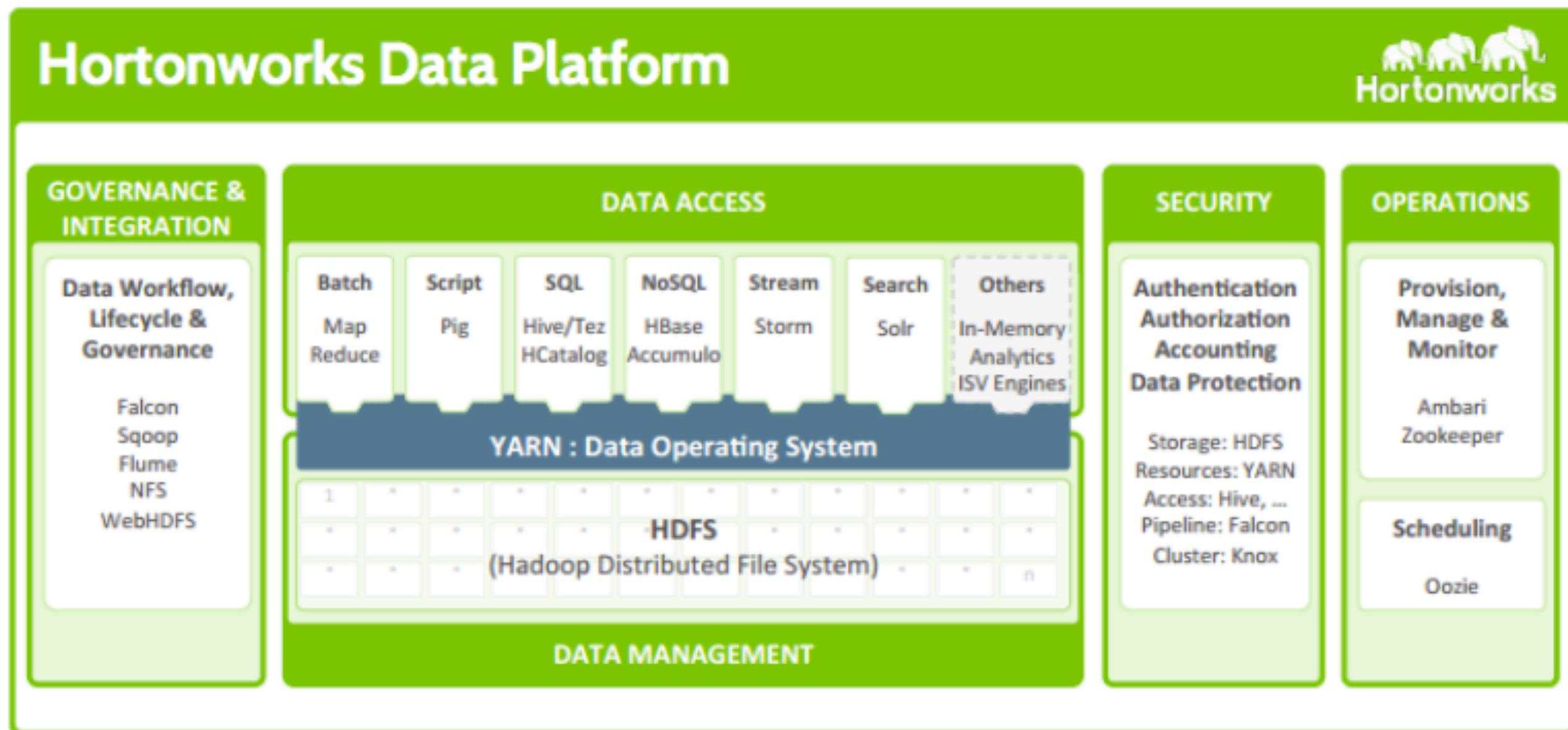
HORIZONTAL
(CHEAPER - “MORE COMPLEX”)



HORIZONTAL SCALABILITY (WITH HADOOP)



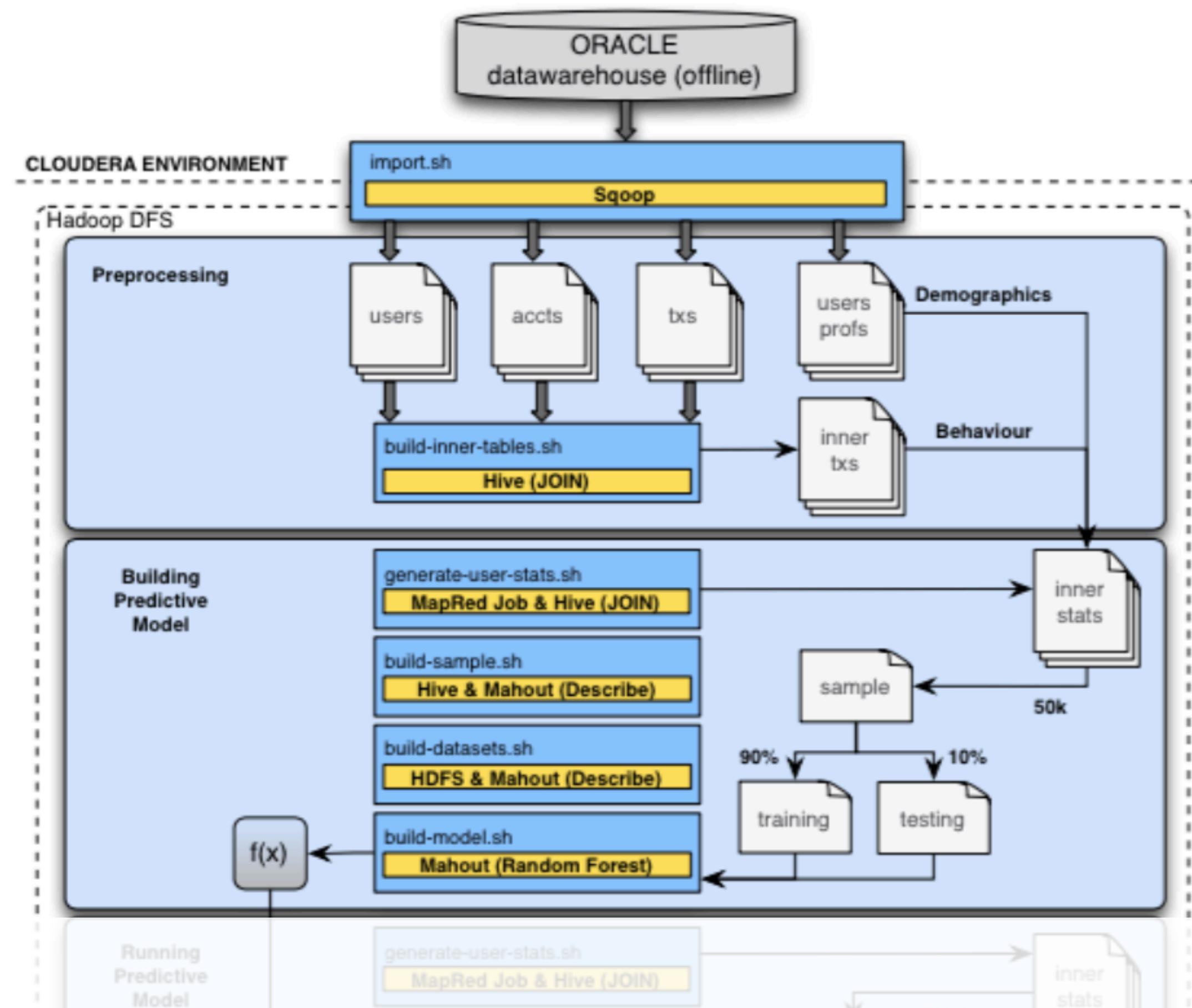
HORIZONTAL SCALABILITY (WITH HADOOP)



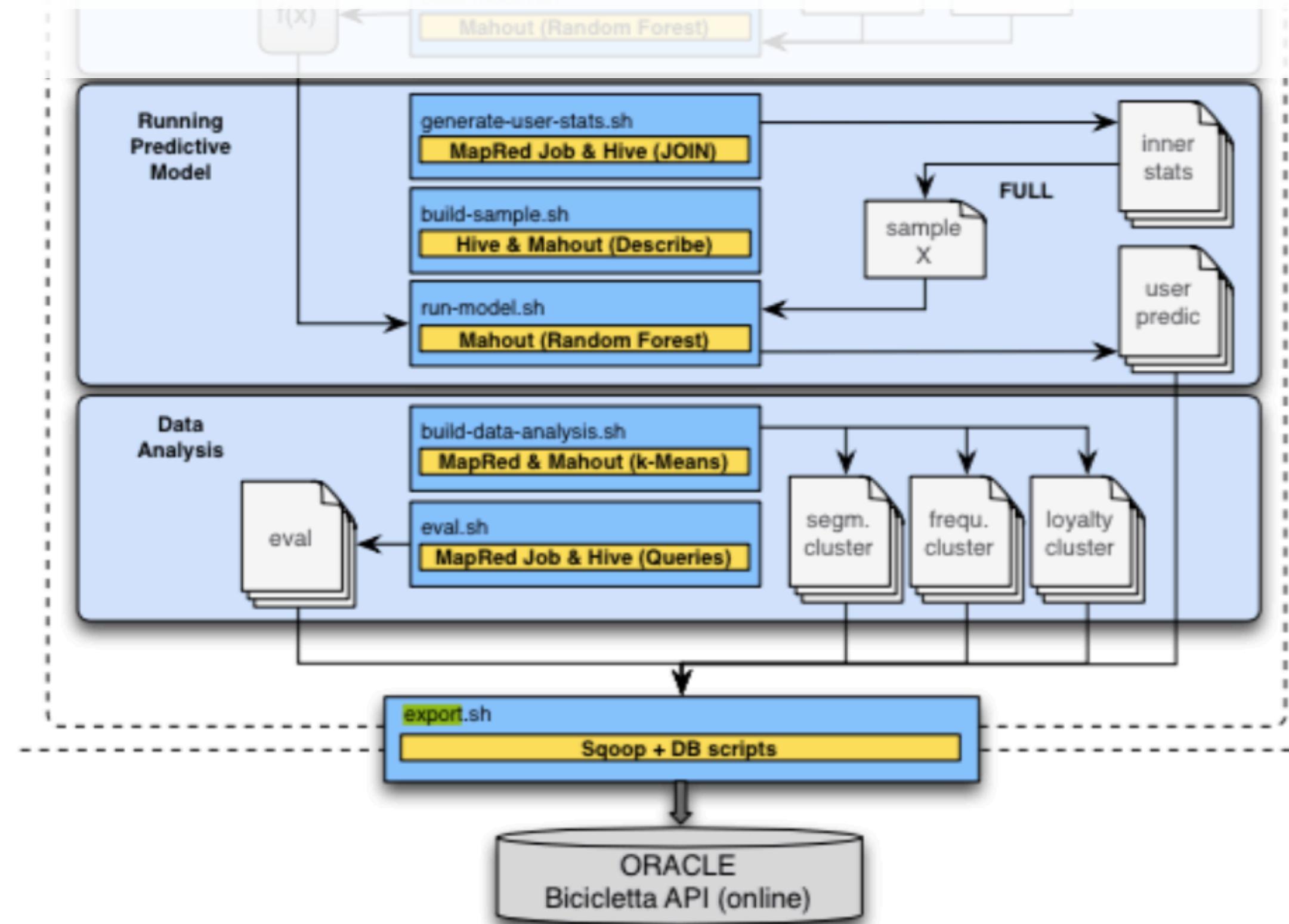
HADOOP COMPONENTS



ARCHITECTURE

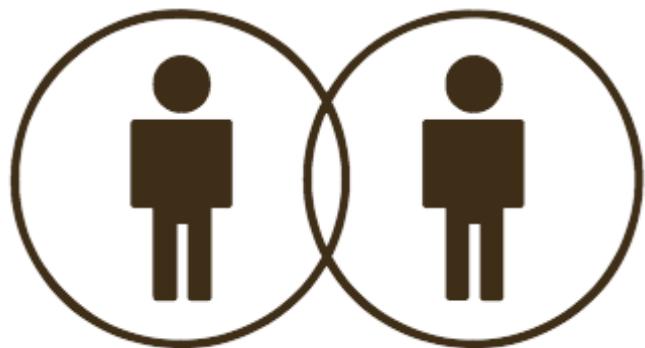


ARCHITECTURE



MARKETING STRATEGIES

Appeal to all persons



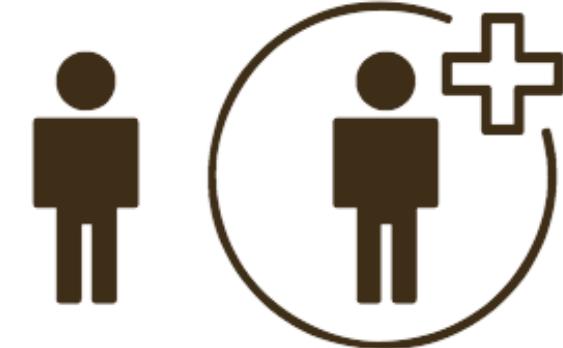
All customers who have purchased products/services in your sector

Reward loyal customers



Customers who primarily purchase products/services in your sector from you.

Win new customers



Customers who have purchased products/services in your sector, but not from you.

Increase number of sales



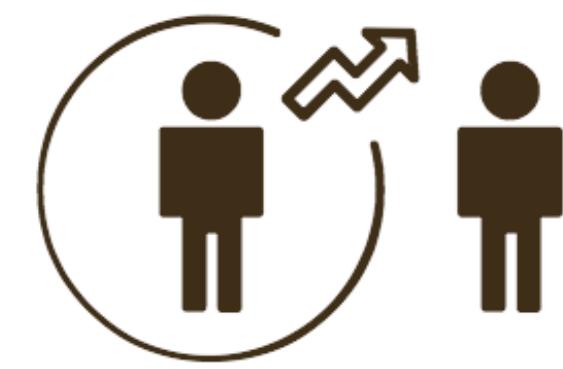
Customers who spend more with competitors than with you.

Reactivate customers



Customers who have not made a purchase from you for some time.

Increase customer frequency



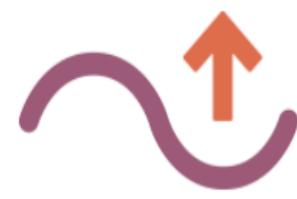
Customers who purchases from competitors more often than from you.

UX

CHOOSE A STRATEGY



REWARD
VISITORS



BOOST
OFF-PEAK



GAIN NEW
CUSTOMERS



REACTIVATE
CUSTOMERS



INCREASE
SPENDING



REWARD
LOYALTY

AVAILABLE (DAYS)

TIME WINDOW

Every day

12:00 14:00

SELECT PRICE SEGMENTS

Low Medium High

GENDER

Any

DEMOGRAPHIC

18 years 65 years

10980
CUSTOMERS

PREVIOUS

CANCEL

NEXT ▶