

# Marketing Campaign: Predicted Conversion Rate Optimization

The Wizards



# OUR TEAM



DWI ABRIANSYA  
ALIMUDDIN



NAUFAL FAJAR  
REVANDA



NI KADEK RINA WATI



IVANDER EDO



ALMAIRA NABILA  
AYUDHIYA



# TABLE OF CONTENTS

**01**

PROJECT  
BACKGROUND

**02**

INSIGHTS

**03**

CLASSIFICATION  
MODEL

**04**

BUSINESS  
RECOMMENDATION



The background features several blue geometric elements: a large circle at the top left, a smaller ring in the upper center, and a large solid circle at the bottom right. On the left side, there are two vertical columns of small blue dots. The text '01' is positioned to the right of the top column of dots.

01

# PROJECT BACKGROUND

# ABOUT COMPANY



2240 visitor from last campaign

## Market Location



CHOCOMART is an American multinational retail corporation that operates a chain of hypermarket (also called supercenters), discount department store and grocery store from the United States, headquartered in San Francisco, California.



Conversion rate  
14,91%

- › 334 Accepted Campaign
- › 1906 Not Accepted Campaign

## Data Market

\$3674

Total revenue



Total cost campaign

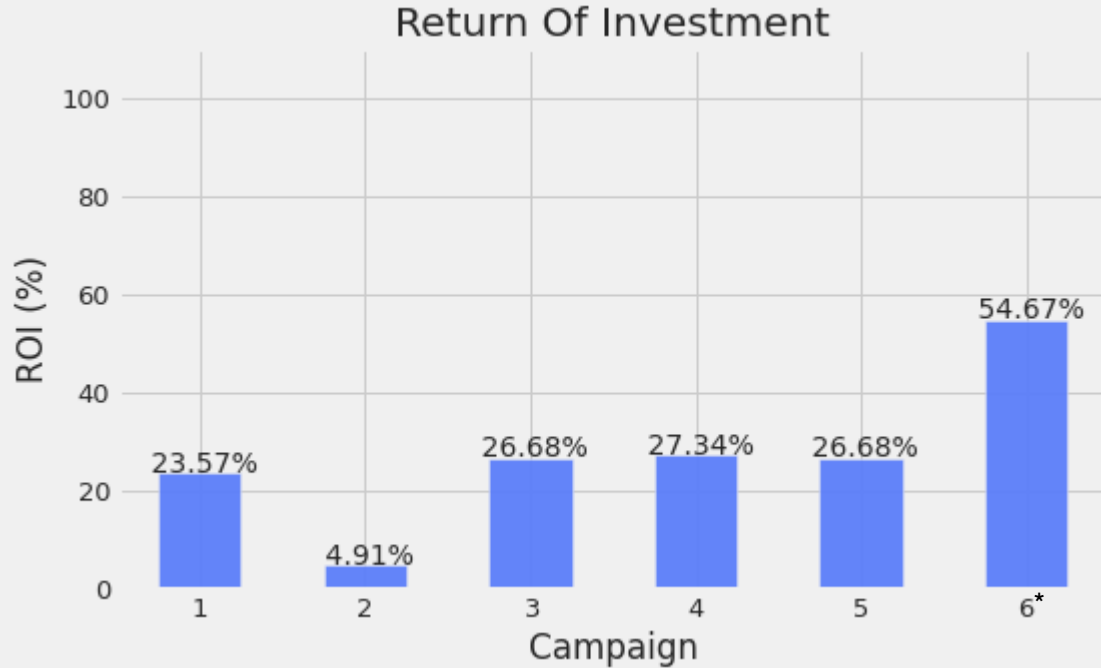
\$6720

Cost per person \$3

Revenue per person \$11

ROI 54%

# PROBLEM



For the last 6 Campaign, Return Of Investment (ROI) of the Campaign never cross 100% marks, meaning that the Campaign always results in Loss.

\*6 = Last Campaign

# OUR GOALS

## TARGET



Increase the Return Of Investment (ROI) without increasing costs

## OBJECTIVE



Train a predictive model which helps the company to predict customer who will accept the campaign in order to maximize the profit of the next marketing campaign.

## BUSINESS METRIC



Return on Investment (ROI)

The background features several blue geometric elements: a large circle at the top center, a smaller ring to its right, and a large solid circle at the bottom right. On the left side, there are two clusters of small blue dots, one near the top and one near the bottom.

02

INSIGHTS



# DATA UNDERSTANDING

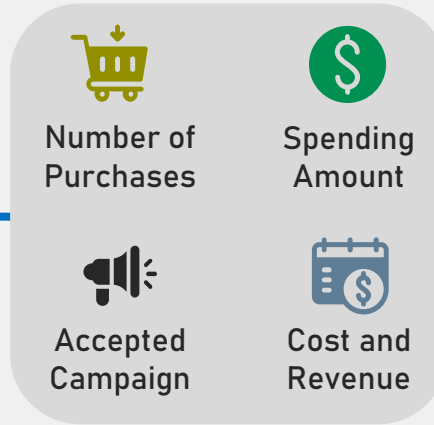
## FEATURES

## TARGET

Customer's Profile



Customer's Record



Number of  
Purchases

Spending  
Amount

Accepted  
Campaign

Cost and  
Revenue

Accepted the last campaign

Did not accept the last campaign

# CUSTOMER'S PROFILE INFORMATION



Relationship  
Status

In Relationship	64%
Single	36%



Age

37 - 55	52%
<37	25%
>55	23%



Number of  
Children

1	50%
0	29%
2	19%
3	2%



Education

Graduation	50%
PhD	22%
Master	17%
2n Cycle	9%
Basic	2%

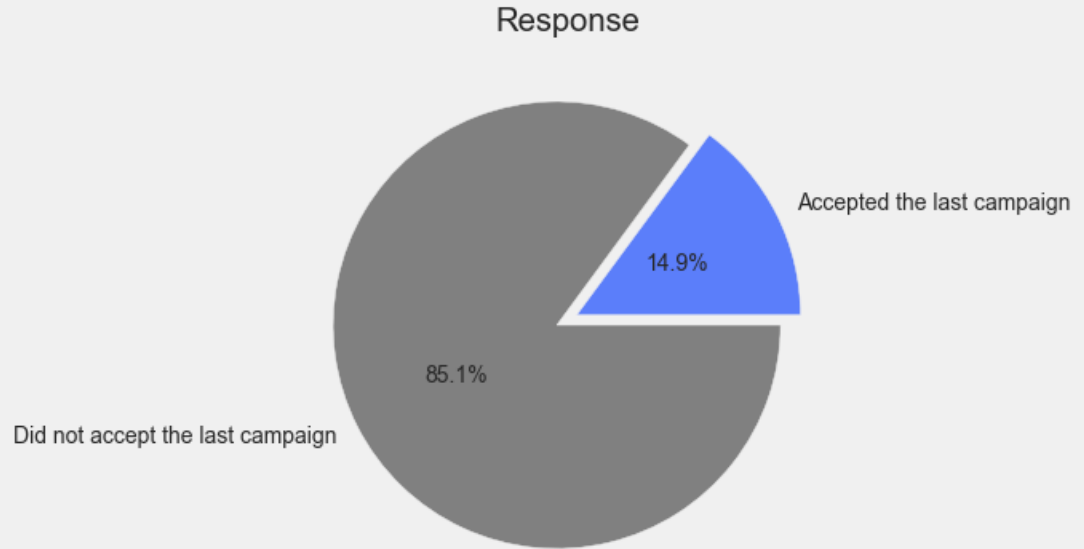


Income

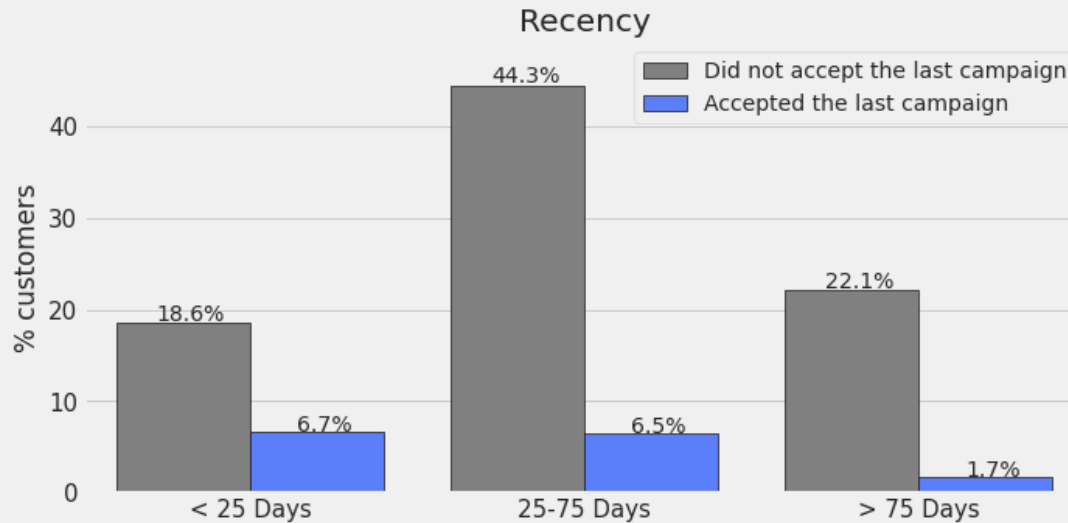
35K - 70K	52%
<35K	25%
>70K	23%
Unknown	1%

# RESPONSE

Out of 2240 customers, only 334 customers (14.9%) who accepted the last campaign. Meanwhile, the rest of them did not accept the last campaign.

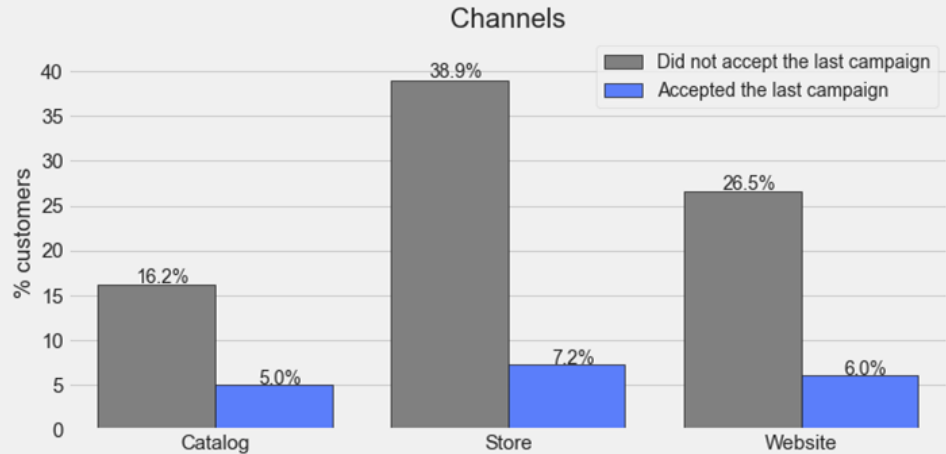
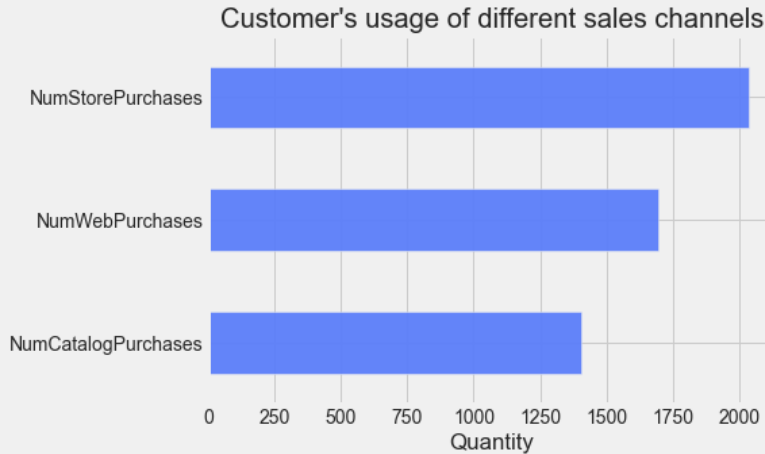


# EFFECT OF RECENCY ON RESPONSE



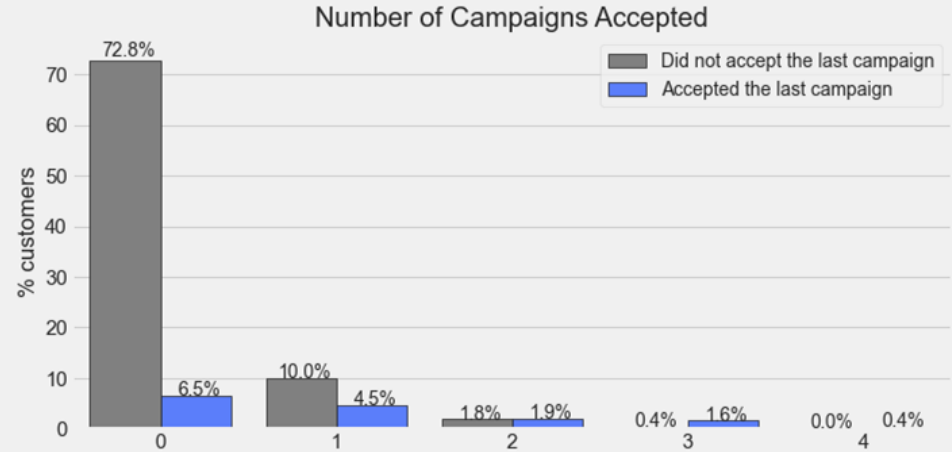
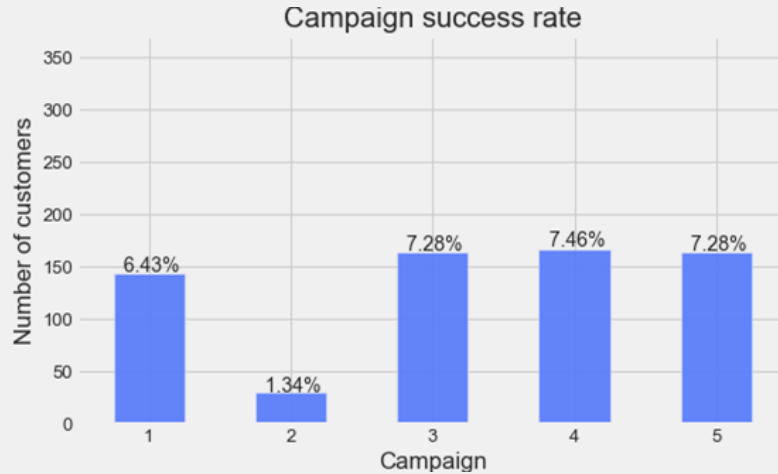
The highest percentage of customers that accepted the last campaign comes from the customers that made their last purchases recently until no more than 75 days.

# EFFECT OF SALES CHANNELS ON RESPONSE



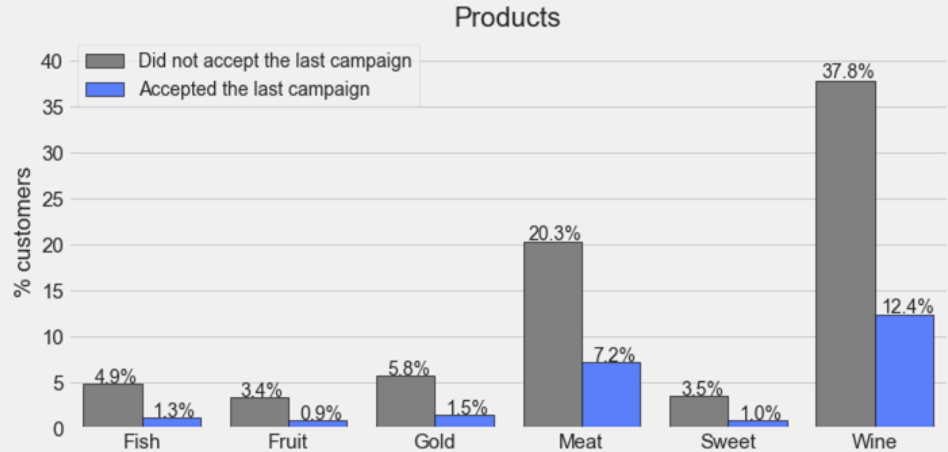
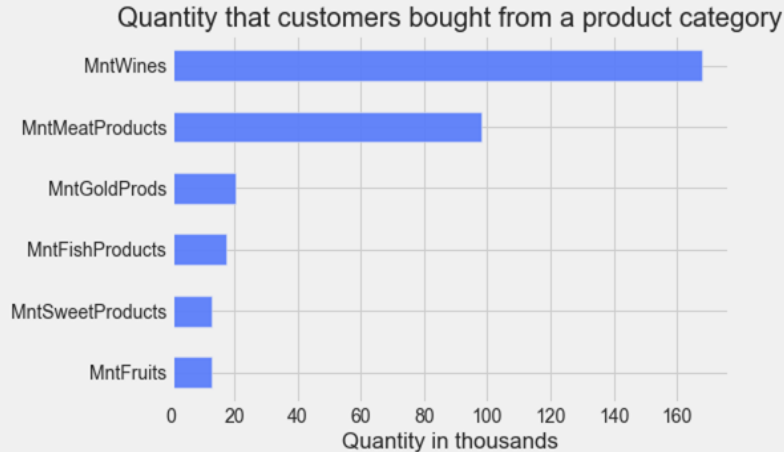
The percentage of customers' purchases that accepted the last campaign are not really different on all three sales channels. Although, most of the purchases are made through store (> 2000 purchases), followed by website and catalog.

# EFFECT OF CAMPAIGNS ON RESPONSE



The last three campaigns were the most “successful” campaigns of all five that have been given to the customers. The more often the campaign accepted by the customers, the more likely they will accept the next campaign.

# EFFECT OF PRODUCT CATEGORIES ON RESPONSE



The most products that purchased by the customers are wines and meats. The customers who bought these two products are also likely to accept the last campaign than the customers who bought another product categories.

# DATA CLEANSING & PRE-PROCESSING

## MISSING VALUE

- No duplicate data found
- There is Null data in the Income column that is dropped
- There are 710 outlier that are dropped

## REMOVING FEATURES

- Z\_CostContact
- Z\_Revenue

## FEATURE ENGINEERING

- Marital status is only divided into In a Relationship and Single.
- Date of birth changed to age column.
- The Kidhome and Teenhome features are categorized into Children.
- Dt\_Customer feature is transformed into Long\_Enroll.
- AcceptedCmp1 - 5 are summed into acc\_cmp.



The background features several blue geometric elements: a large circle at the top center, a smaller ring to its right, and a large solid circle at the bottom right. On the left side, there are two vertical clusters of small blue dots. The number '03' is displayed in a large, bold, blue font.

03

# CLASSIFICATION MODEL

# FEATURE CORRELATION

Response	-0.03	0.03	-0.21	0.06	0.09	0.13	0.04	0.05	0.15	0.10	0.13	0.15	-0.04	0.14	-0.01	0.18	-0.01	-0.08	0.31	1.00
	ID	Income	Recency	MntWines	MntFruits	MntMeatProducts	MntFishProducts	MntSweetProducts	MntGoldProds	NumDealsPurchases	NumWebPurchases	NumCatalogPurchases	NumStorePurchases	NumWebVisitsMonth	Complain	Long_Enroll	age	Children	acc_cmp	Response

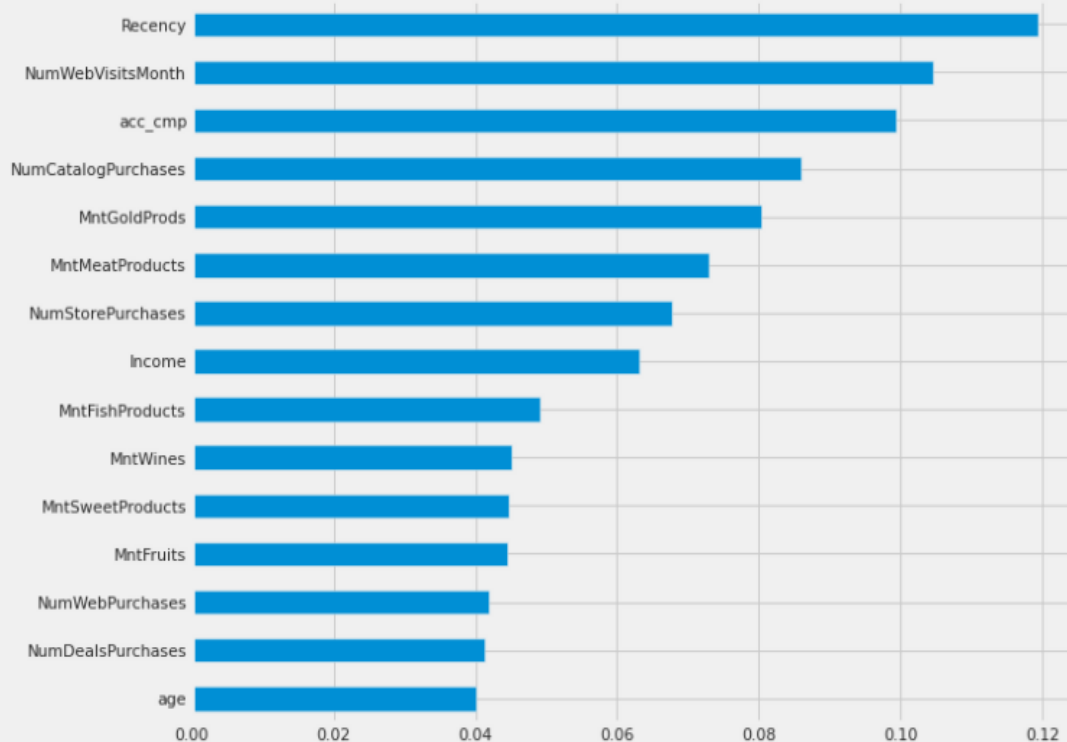
- The most correlated feature towards response is acc\_cmp with positive 0.31.
- Followed by Recency with negative 0.21.
- The third most correlated feature is Long\_Enroll with positive 0.18.

# MODELLING RESULT

	Decision Tree	AdaBoost	XGBoost	Random Forest
Accuracy	87%	91%	92%	93%
Precision	40%	56%	68%	77%
Recall	45%	64%	53%	43%
F1-Score	42%	59%	60%	55%
F0.5-Score	41%	57%	64%	66%
AUC	71%	79%	75%	71%
Train Score	94%	95%	95%	100%
Test Score	87%	91%	91%	93%

The Random Forest algorithm shows the best result on Precision and F0.5-Score among the others with 77% and 66% respectively. F0.5-Score means that we put more weight on Precision than Recall with ratio 2:1.

# FEATURE IMPORTANCE



The 3 top tier attributes that affect the response are recency, monthly web visitors, and number of previously accepted campaign.

1. The number of days since last purchase (**recency**) is the most impactful attribute to customer response the campaign, with approximately 12%.
2. The second is the **number of website visitors**, which is just above 10%.
3. Then, followed by 10%, which is the **number of previously accepted campaign**.

# CONFUSION MATRIX

CONFUSION MATRIX		PREDICTED RESPONSE	
		Accepted Campaign	Not Accepted Campaign
ACTUAL RESPONSE	Accepted Campaign	TRUE POSITIVE 20 Customers 4.42%	FALSE NEGATIVE 27 Customers 5.97%
	Not Accepted Campaign	FALSE POSITIVE 6 Customers 1.33%	TRUE NEGATIVE 399 Customers 88.27%

Using y\_test data, we predict that 20 Customers will surely accepted our Campaign out of 26 Total Customers that we predict will accept the Campaign.

The slide features several decorative elements: a large blue circle at the top center, a smaller blue circle to its right, a large blue semi-circle at the bottom right, a vertical line of blue dots on the top left, and a horizontal line of blue dots on the bottom left.

04

# BUSINESS IMPACT & RECOMMENDATION

# PREDICTED CAMPAIGN

TOTAL  
CUSTOMERS



26 CUSTOMERS

CUSTOMER  
LEAD



20 CUSTOMERS

TOTAL  
COST



\$78

TOTAL  
REVENUE



\$220

ROI



282,05%

Result with data y\_test

# CAMPAIGN EXPANSION



53 customers



20 customers



\$159



\$220



138,36%

MID  
CASE

53 customers

33 customers

\$159

\$363

228,30%

BEST  
CASE

53 customers

47 customers

\$159

\$517

325,16%



# BUSINESS RECOMMENDATION

Customers whose last purchases made recently until no more than 25 days ago



Reward them for their multiples purchases because they can be early adopters to new products. Suggest request them to "Refer a friend".

Also, they can be the most loyal customers that have the habit to order.

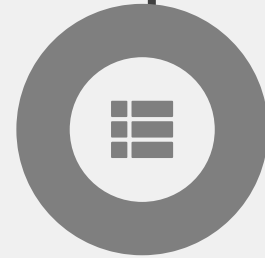
Customers whose last purchases made 25 to 75 days ago




Inform them about the discounts to keep them spending more money on our products.

Create loyalty cards in which they can gain points each time of purchasing and these points could transfer into a discount.

Customer whose last purchases made more than 75 days ago



Send them personalized emails to encourage them to order.



We have to focus first on the people  
who likely to buy, even if it's small  
thing in our product.

—THE WIZARDS





THANK YOU

Do you have any questions?