

# monopolio

by



Matthew

Daniela

Shaila

# AGENDA



1

Introduction to DD360/Monopolio

2

Our problem: **Who is using the website?**

3

Our data : **User click-data & active users**

4

Our strategic approach: **User segmentation through click-data**

5

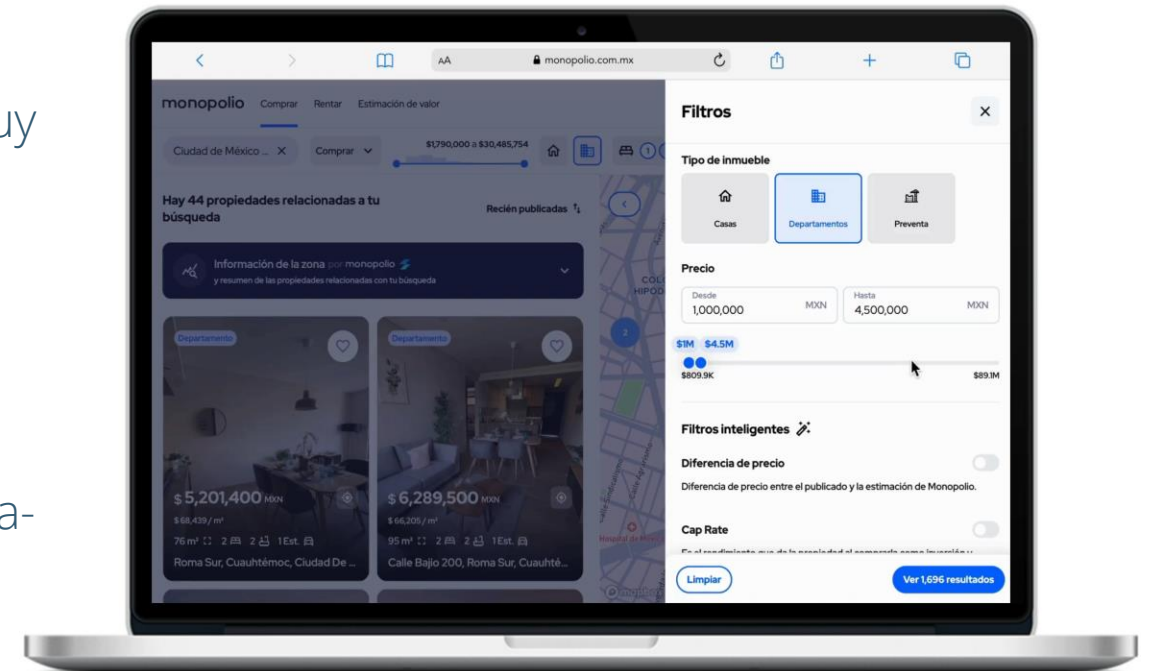
Key Discoveries, **user personas: Millennials, Dreamers, Clickers, Buyers**

# About monopolio

## Your Digital Real Estate Partner

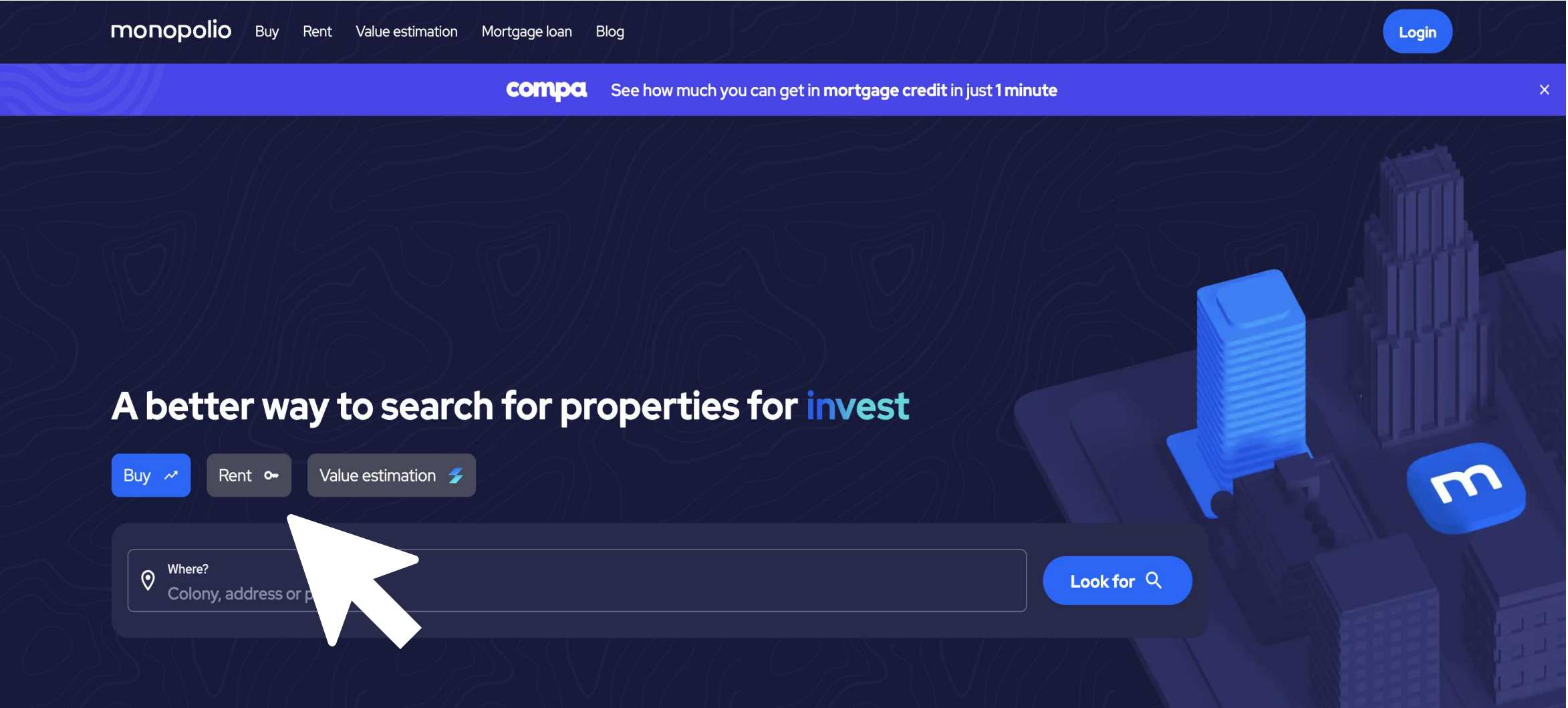
Monopolio is a [real estate platform](#) that allows users to buy and rent properties, connect with sellers, purchase appraisals, and estimate potential mortgage options

**The Vision:** Create a [proptech ecosystem](#) that enhances transparency, efficiency, and user experience through data-driven insights and seamless technology.



Think of Monopolio as  Zillow's cousin that lives in Mexico

1.- Looking for a place to rent

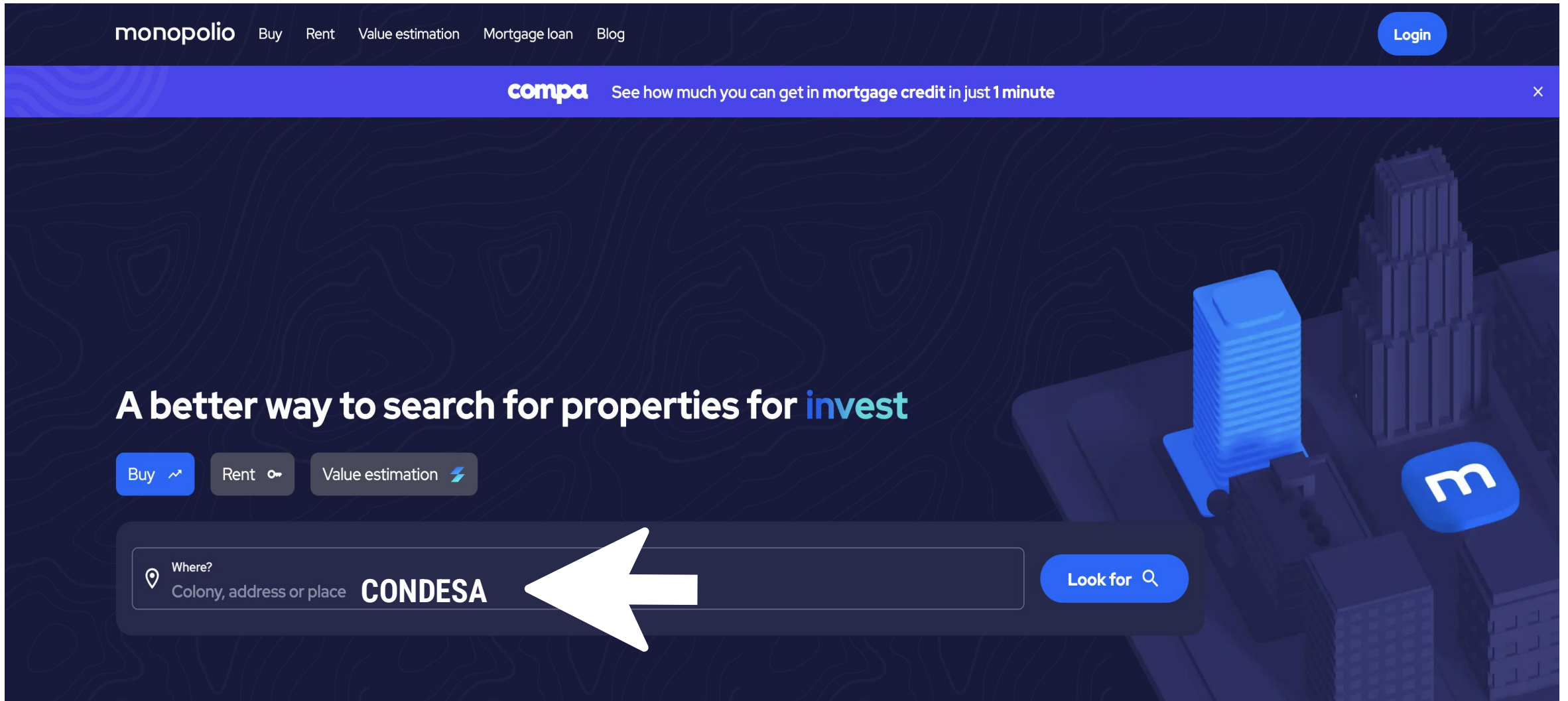


## Navigating Monopolio

monopolio

1.- Looking for a place to rent

2.- Indicating the neighborhood where they want to live





# Navigating Monopolio

- 1.- Looking for a place to rent
- 2.- Indicating the neighborhood where they want to live
- 3.- Exploring the available rental properties

monopolio




BuyRentValue estimationMortgage loanBlog

Login


Condesa Ciudad de Mé...

Buy


\$2,000,000 to \$80,000,000



1234+

 Opportunities

More filters




There are 267 properties related to your search


Relevance

Area information by monopolio

Chance

Pre-sale





\$4,365,644 MXN


\$65,159 / m²

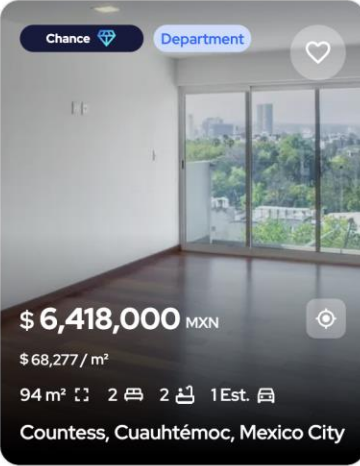
67 m² 2 2

Countess, Cuauhtémoc, Mexico City

Chance

Department





\$6,418,000 MXN


\$68,277 / m²

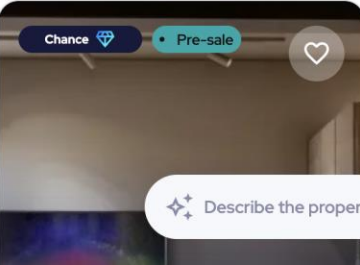
94 m² 2 2 1Est.

Countess, Cuauhtémoc, Mexico City

Chance


Pre-sale

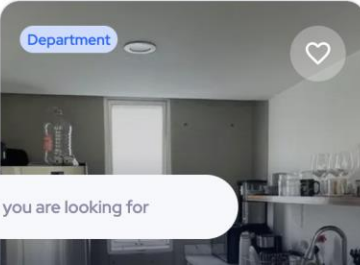


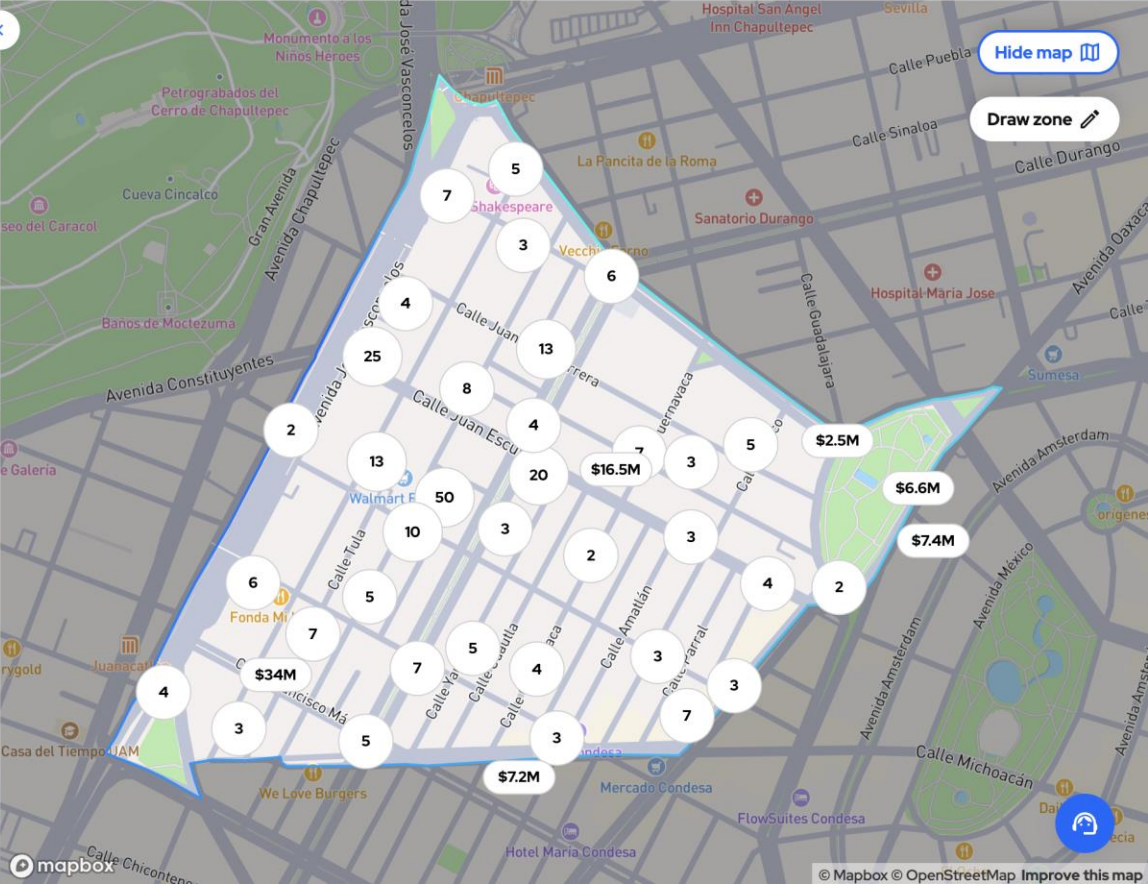


Describe the property you are looking for

Department



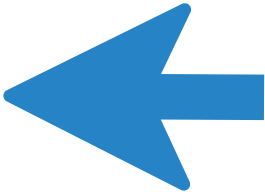




Hide map

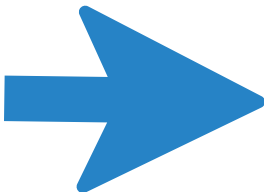
Draw zone

© Mapbox © OpenStreetMap Improve this map



# Navigating Monopolio

- 1.- Looking for a place to rent
- 2.- Indicating the neighborhood where they want to live
- 3.- Exploring the available rental properties
- 4.- **Selecting a listing they like**
- 5.- Contacting an agent



monopolio

BuyWashValue estimateMortgage loanResources

Zona Condesa Ciudad...X

Wash▼

\$57,000 a \$187,000

There are 71 properties related to your search

Recently published ↕

Area information by monopolio ⚡

▼

Chance💎

Department

\$65,000MXN

\$542 / m²

120 m² 3 2 1 East.

Condesa, Cuauhtémoc, Mexico City

Chance💎

Department

\$65,000MXN

\$411 / m²

158 m² 2 2 2 East.

B H, Condesa Racetrack, Cuauhtémoc, Mexico City

Department

\$90,000MXN

\$692 / m²

130 m² 3 2 1 East.

Sonora, Hippodrome, Cuauhtémoc, Mexico City

Department

\$70,000MXN

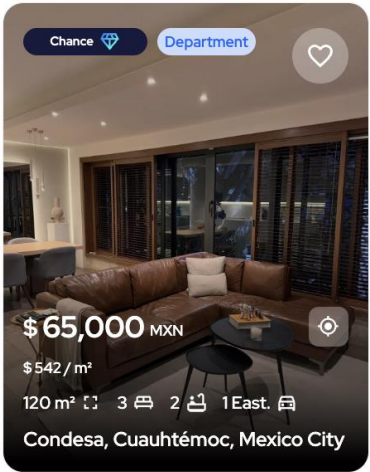
\$419 / m²

167 m² 3 2 2 East.

Condesa, Cuauhtémoc, Mexico City

# Navigating Monopolio

- 1.- Looking for a place to rent
- 2.- Indicating the neighborhood where they want to live
- 3.- Exploring the available rental properties
- 4.- **Selecting a listing they like**
- 5.- Contacting an agent



### Market estimate

Estimated selling price

by monopolio

\$ 8,312,189

MXN

Estimated price range:

\$ 7,314,726 min. - \$ 9,309,652 max.

The published price is 4.36 % below the estimated Monopoly price.

Estimated price per m²

\$79,925

Estimated income

\$44,692

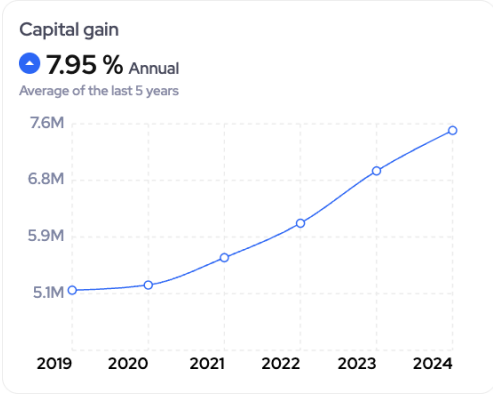
Estimated rent per m²

\$434

Estimated cap rate

6.40%

### Price history



### Property features

Type of property

Department

Surface

103 m²

Floor

11

Antique

7 Years

Bedrooms

2

Bathrooms

2

Parking lot

2

### Amenities

Balcony

Elevator

Gym

Jacuzzi

Multipurpose room

Parking lot

Utility room

Special facilities

Security

Terrace

Washing area

Water tank

Pets are welcome

Enjoy this spectacular apartment with a panoramic view of almost 300 meters from its 10th floor, you can see Chapultepec Castle, among others, and with the best amenities in an impeccable Element Condesa building. Ideal for investors, it is sold rented with a tenant, rent \$ 35,000. Great location. Luxury finishes, terraced balcony with a beautiful view, controlled access with 24-hour surveillance. 2 spacious bedrooms with closets, one of

[See more](#)

### Area metrics

Mobility

Pedestrian paradise

You can complete your daily activities by walking in 15 minutes.

84

100 points

Traffic in the...

SLOW

54 out of 100 points

9:00

13:30

18:30

19:30

Cost of living

High

Expensive, it offers exclusive amenities and services.

70

100 points

Proximity to work

Near

Short distance, quick movements.

46

100 points



# Navigating Monopolio

- 1.- Looking for a place to rent
- 2.- Indicating the neighborhood where they want to live
- 3.- Exploring the available rental properties
- 4.- Selecting a listing they like
- 5.- Contacting an agent



For rent

Department

Published 8 days ago

\$ 90,000 MXN

\$ 692 / m²

Sound Sound

Hippodrome, Cuauhtémoc, Mexico City

130 m² 3 2 1East.

Contact

Estimates

Featur

🔊 Contact

ID: EB-SP3352

EB

Homes Real Estate

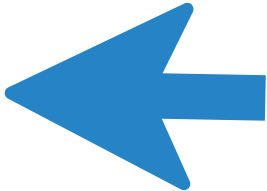
\$ 90,000 MXN

Contact

Homes Mx

\$ 90,000 MXN

See ad



# Our Challenge

## Understanding how users interact with **monopolio**

Monopolio seeks to **understand its user base and how visitors interact with the platform** to optimize the user experience, improve engagement, and drive conversions.

# Our Proposal

User segmentation through **unsupervised learning** based on click behavior, **combined with explainable ML** techniques to interpret and characterize the clusters.



# Data overview

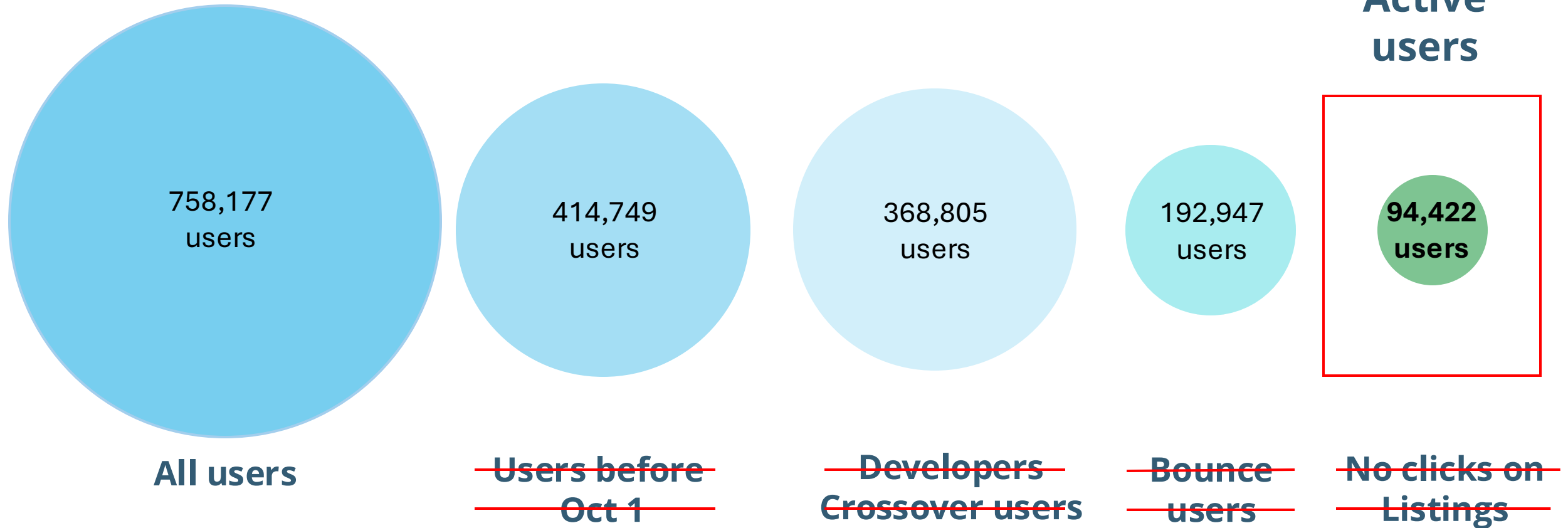
## User Data: ~10 million clicks

User id	Type of click	Event time
2161	autocomplete_selected	2024-10-21 22:21:54
	search_selected	2024-10-21 22:21:57
	gridView_viewed	2024-10-21 22:22:00
	filters_applied	2024-10-21 22:22:04
	search_results	2024-10-21 22:22:04
	listing_selected	2024-10-21 22:23:58
	gridView_viewed	2024-10-21 22:25:09
	filters_applied	2024-10-21 22:25:13
	search_results	2024-10-21 22:25:13
	listing_selected	2024-10-21 22:30:12

## Properties Data: ~1 million properties

Property id	Latitude	Longitude	Property type	Price sale
0	20.52	-103.48	house	\$2,558,162
1	21.03	-89.56	house	\$4,140,462
2	20.69	-100.45	apartment	\$4,100,188
3	25.73	-100.38	house	\$3,888,696
4	25.64	-100.38	apartment	\$11,482,160

# Final Dataset





# Methodology Overview

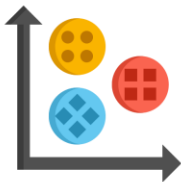
1

**Preprocessing**  
Feature Engineering



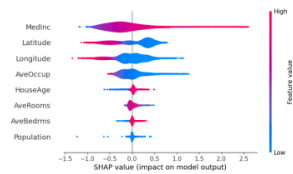
2

**Model**  
K-Means Clustering



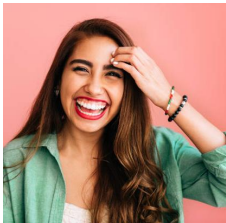
3

**Explainability**  
SHAP Values



4

**Customer Insights**  
User Personas



# Preprocessing



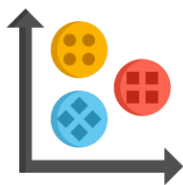
1

**Preprocessing**  
Feature Engineering



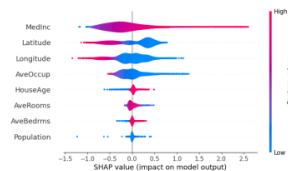
2

**Model**  
K-Means Clustering



3

**Explainability**  
SHAP Values



4

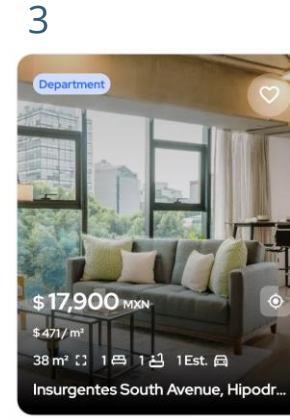
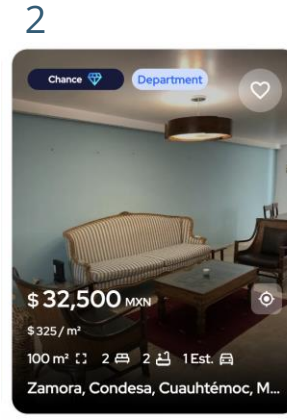
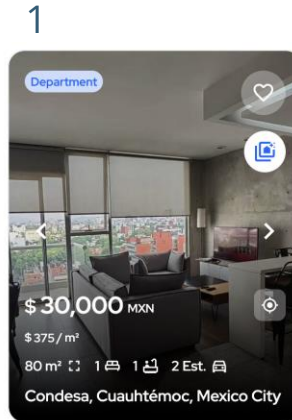
**Customer Insights**  
User Personas





1

# Feature Engineering for Ana



Average Price \$28,725 MXN



Standard deviation 7447

Radius of listings 3.5 km



Weekdays 2



1

# Preprocessing: Feature engineering

monopolio

## Engagement metrics



Browsing time

Browsing sessions

Weekdays vs weekends

## Property interactions



Property Type

Location

Average distance

Rent or Buy properties

## Price metrics



Average price

Standard Deviation

Luxury score

## Filter applications



Essential characteristics

Extra characteristics

Amenities

Opportunities

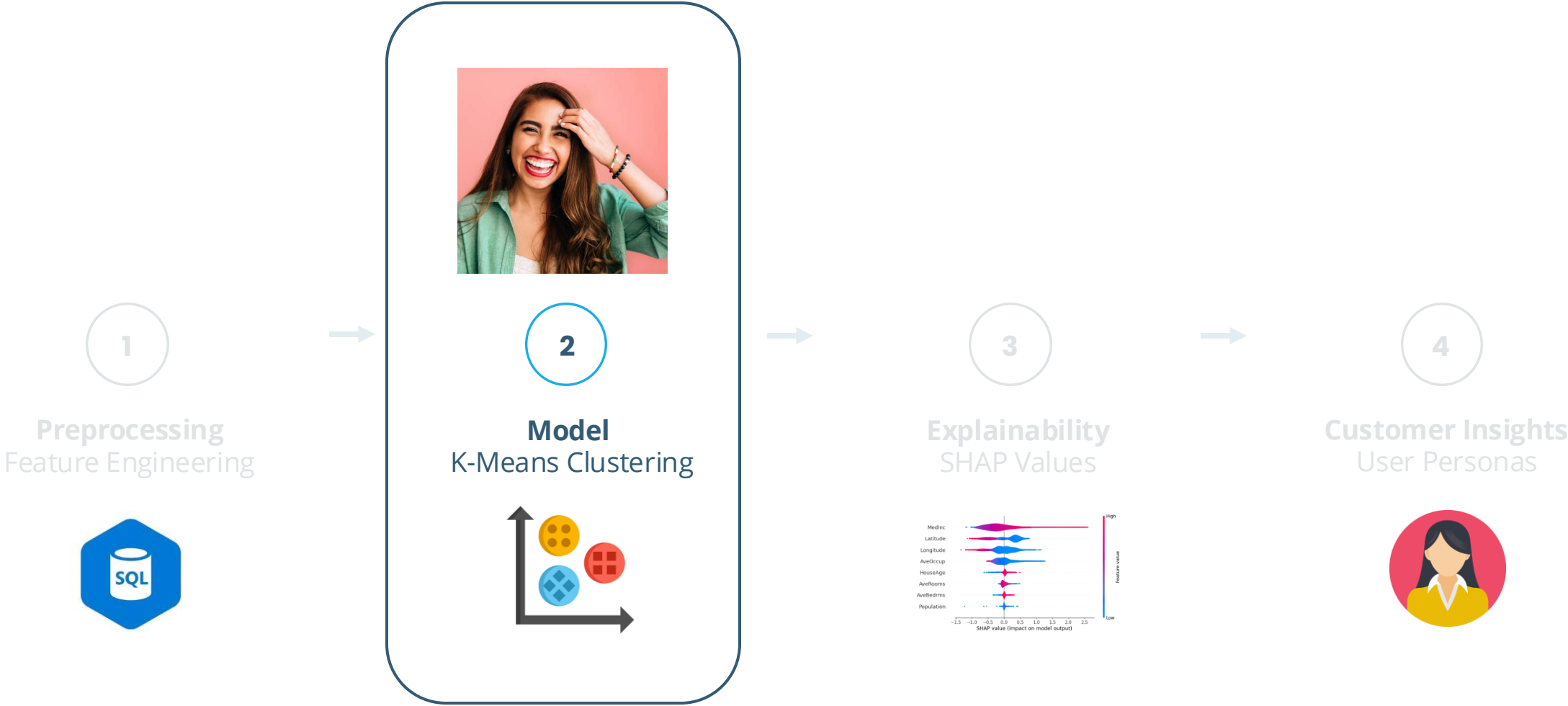




# Model input data: 94,422 users

User id	Average price	Standard dev. price	# Visits	Unique properties	Dummy apartment	Dummy house	Filters on # rooms/baths	Filters on property type/ surface	Filters on amenities	Filters on investment value	% weekdays	...
1	\$7,400 K	0	17	1	1	0	1	0	0	0	100	...
2	\$1,946 K	107K	20	2	1	0	0	0	0	0	67%	...
3	\$2,960 K	0	15	14	1	0	2	1	1	1	0%	...
5	\$6,800 K	0	8	1	0	1	0	0	0	0	45%	...
7	\$2,564 K	0	40	1	1	0	3	1	1	1	0%	...
8	\$3,980 K	0	1	54	0	1	0	0	0	0	100%	...

# K-Means Clustering





2

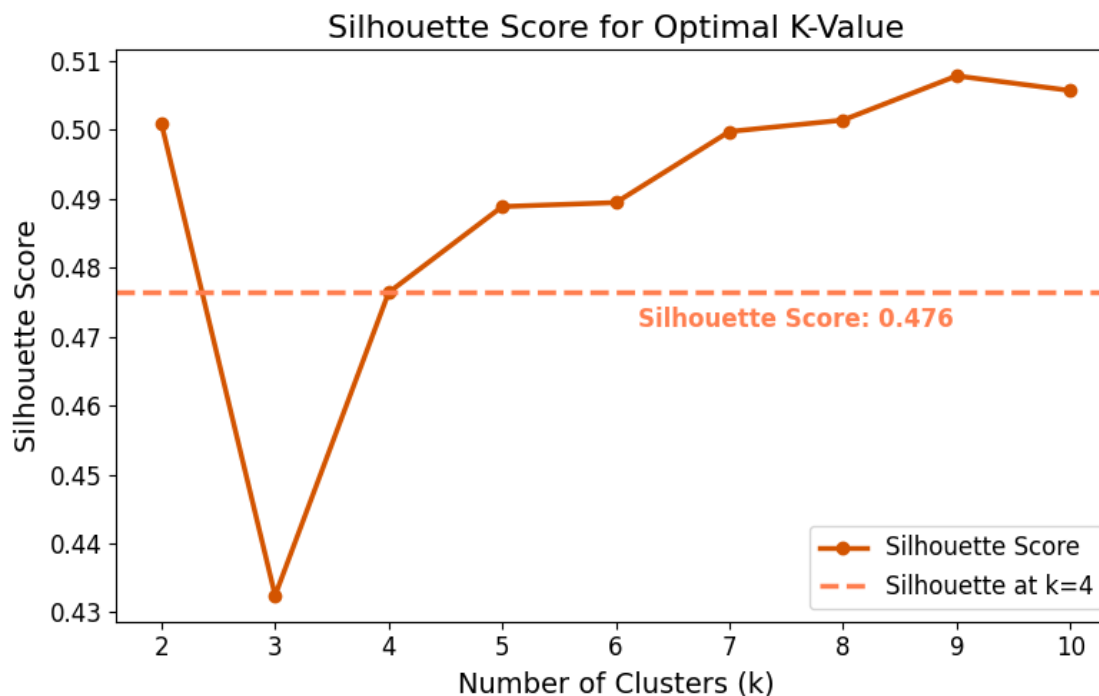
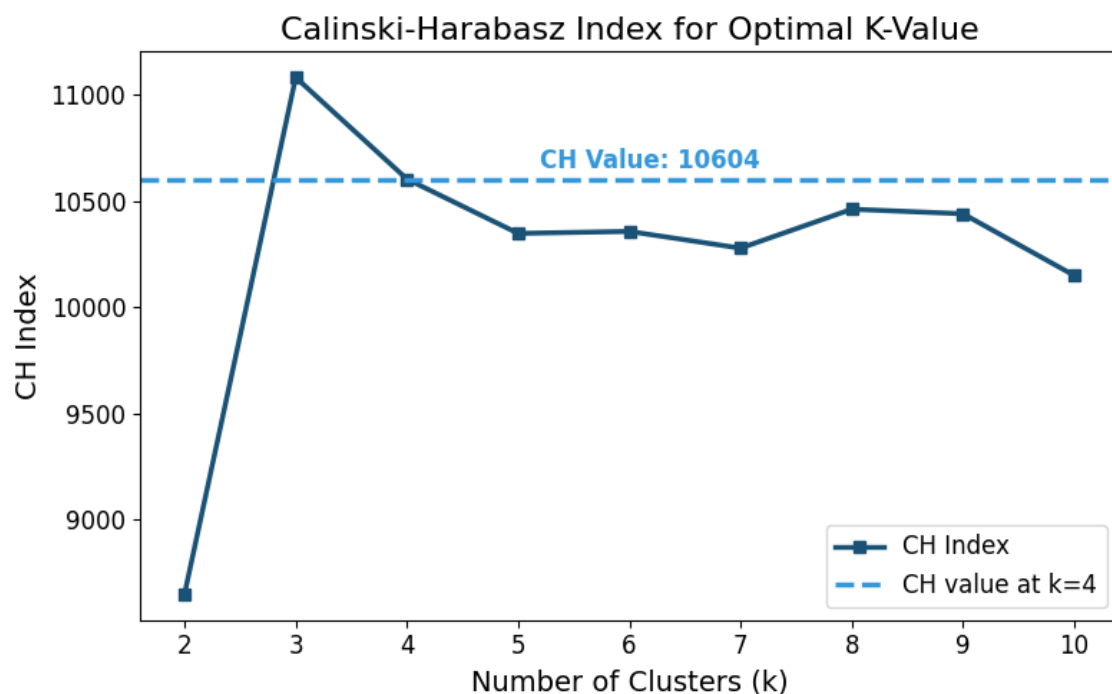
# K-Means Clustering

**Goal:** Applied K-means clustering to classify users based on behavioral patterns

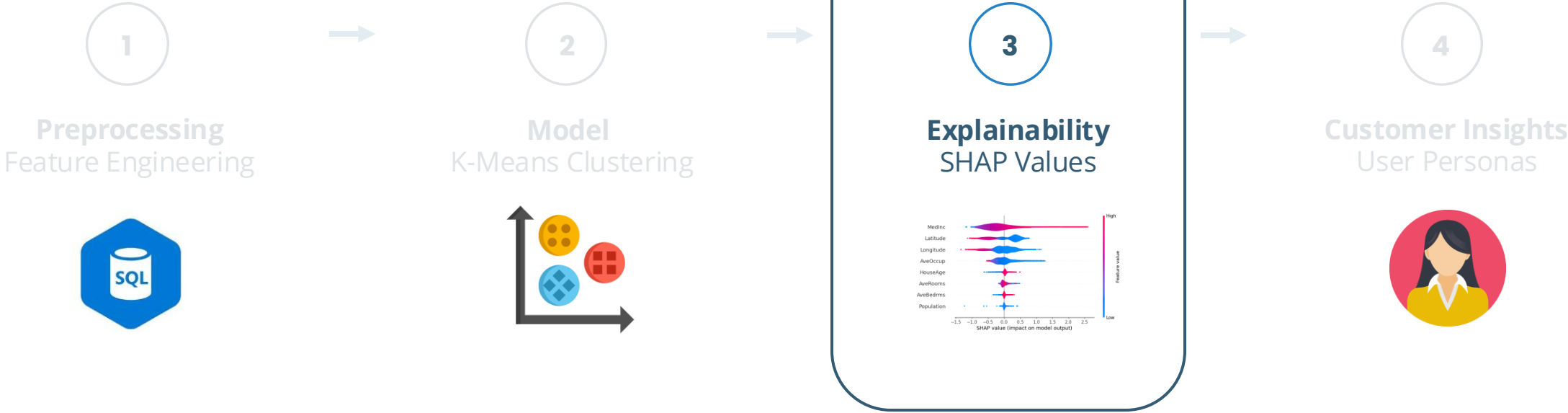
**Tuning:** Determined optimal number of clusters using:

- *Calinski-Harabasz Index* to assess between vs. within cluster spread
- *Silhouette* score analysis to evaluate cohesion vs. separation (per point)

**Output:** Grouped users according to web browsing behaviors, creating user clusters

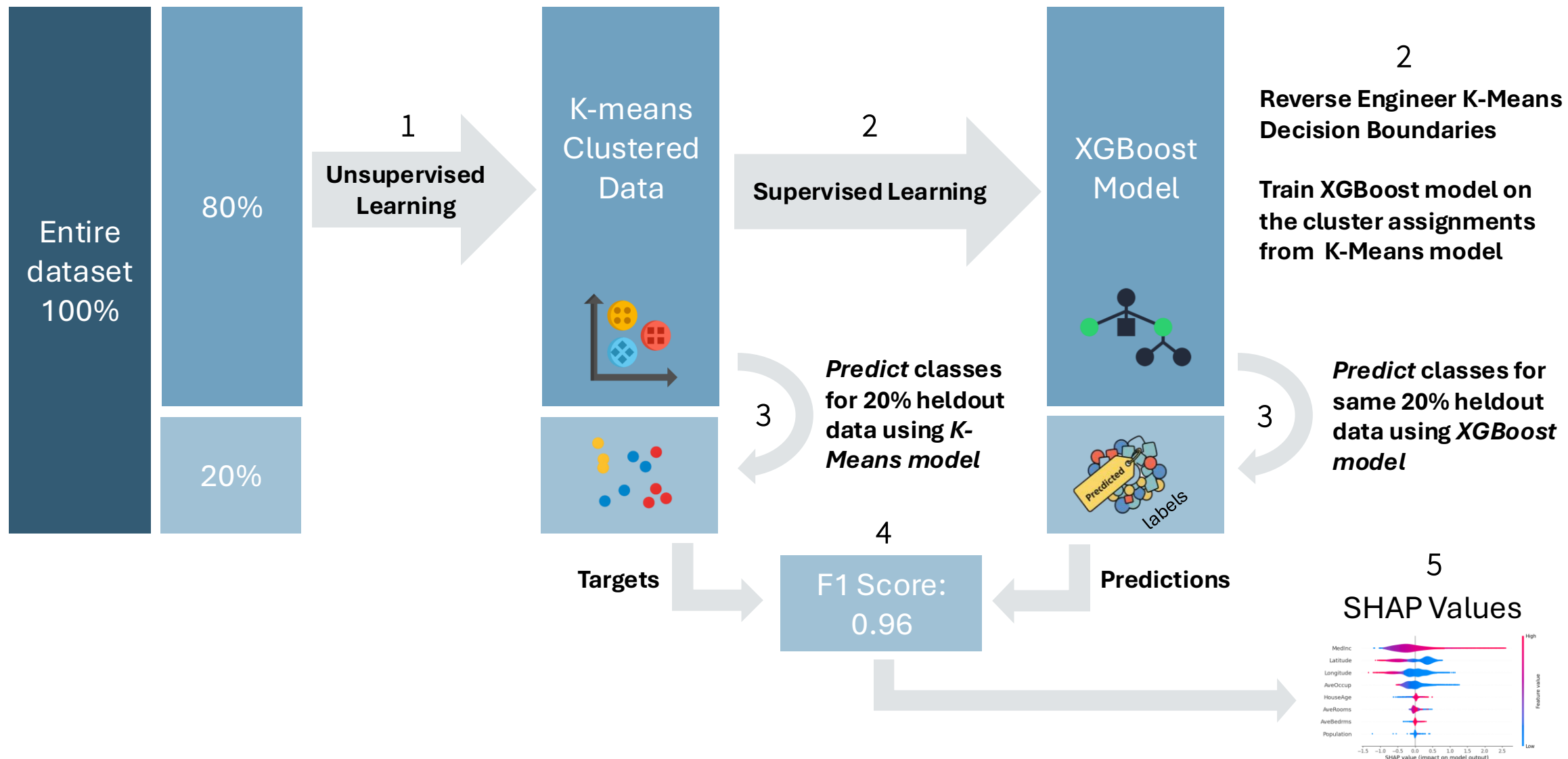


# Explainability





# K-Means and XGBoost Model Training Pipeline

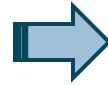
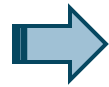


3

# Local Interpretability: Explaining Ana's Predictions



Cluster 2



## Predicted Probabilities

Cluster 1

0.004

Cluster 2

**0.940**

Cluster 3

0.055

Cluster 4

0.001

?

## Average Predicted Probabilities

0.617

0.008

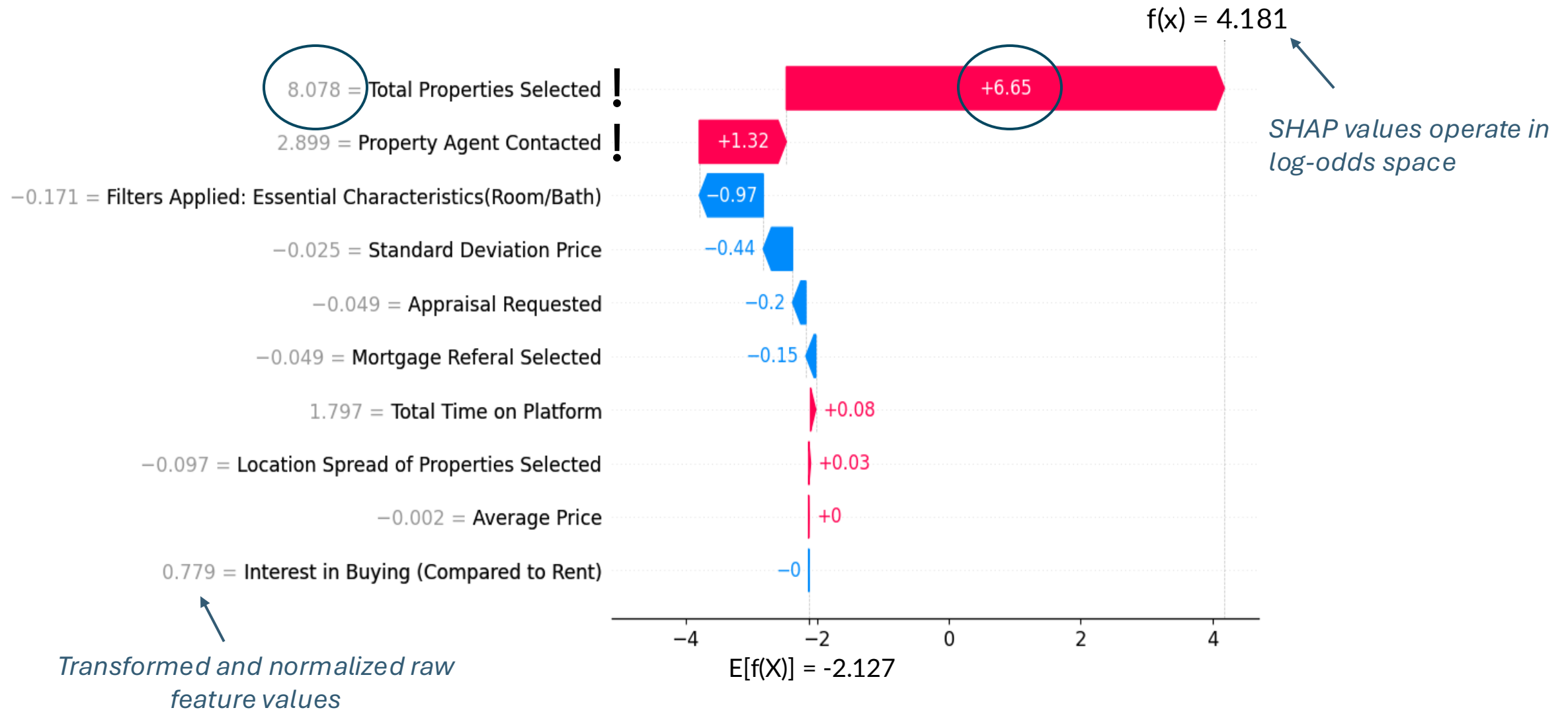
0.036

0.338

SHAP values describe each feature's contribution towards shifting individual predicted probabilities away from expected predicted probabilities.

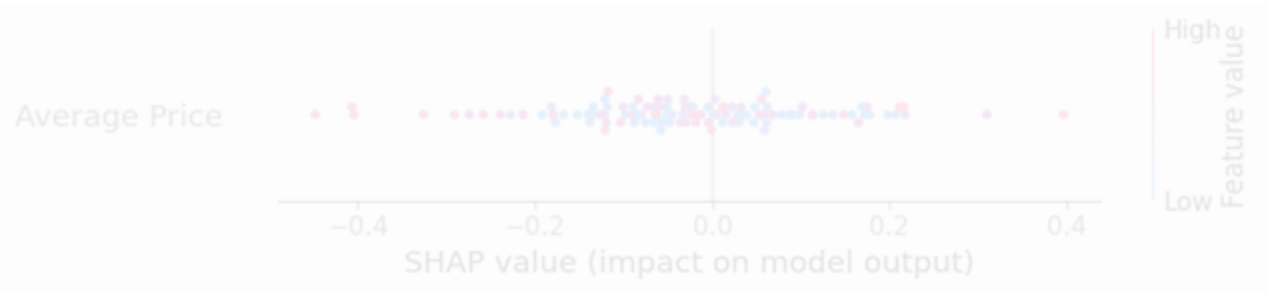
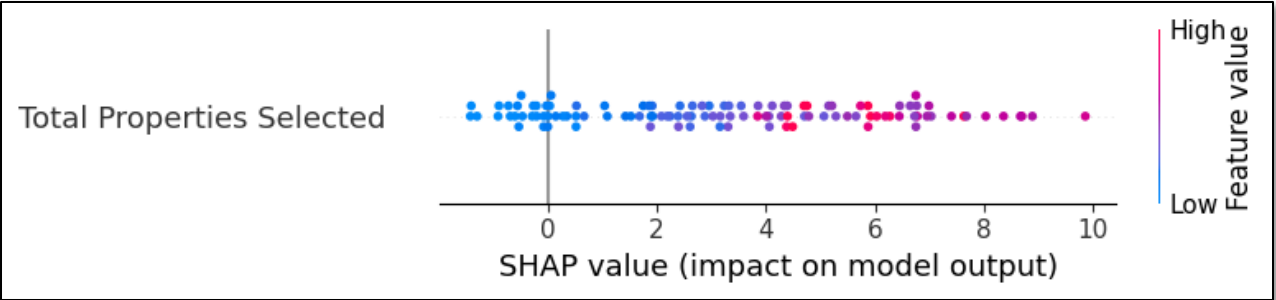
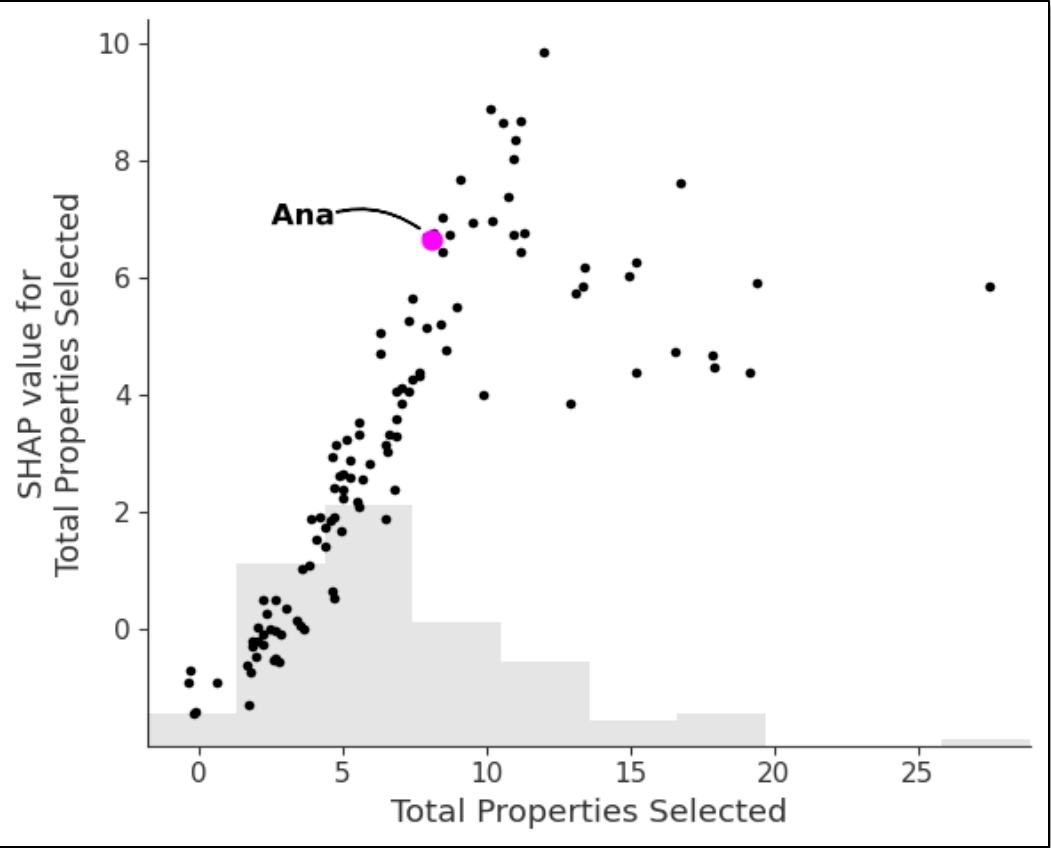
3

## Local interpretability: Explaining Ana's Cluster 2 SHAP Values.



# Interpreting SHAP plots

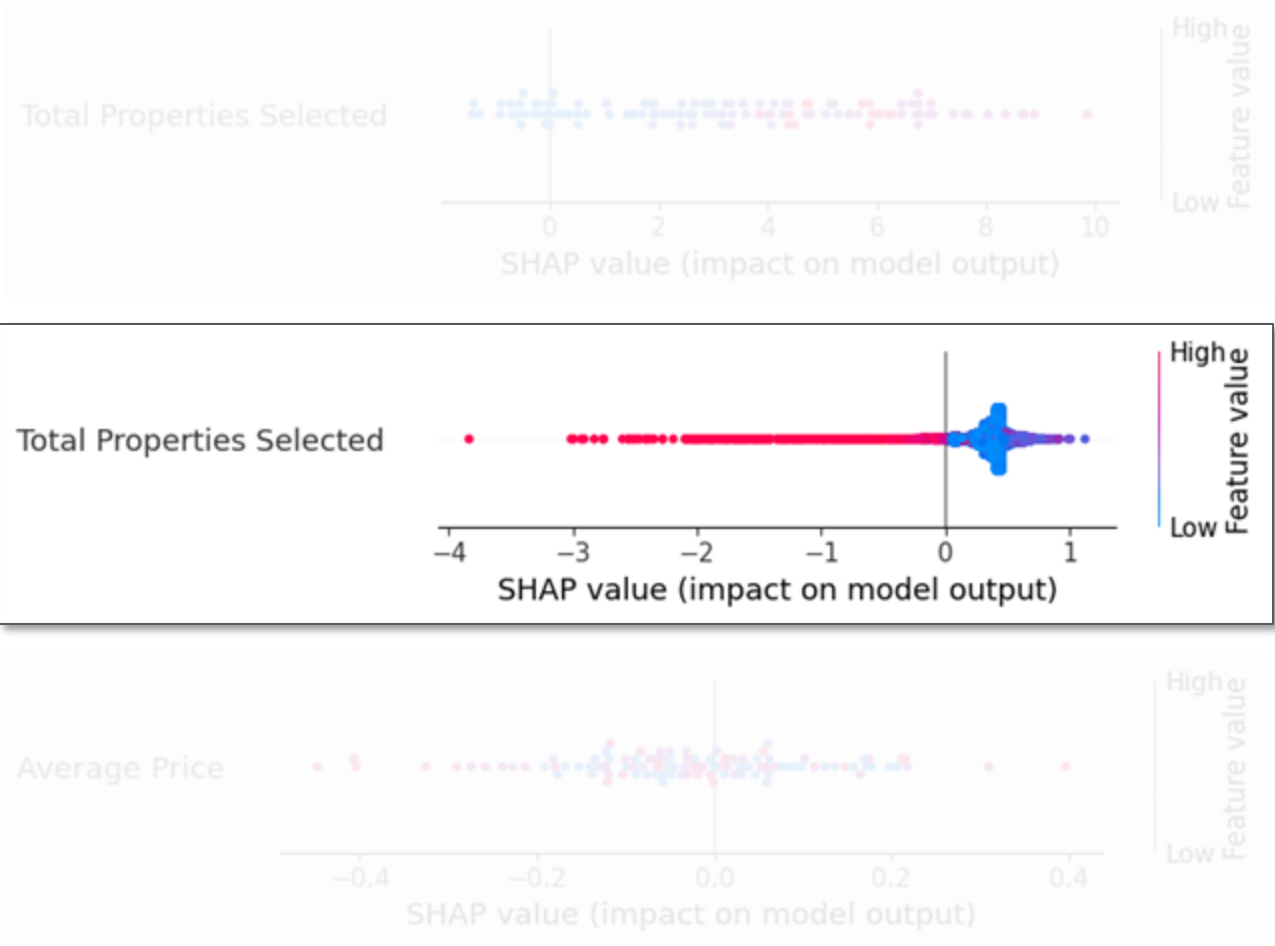
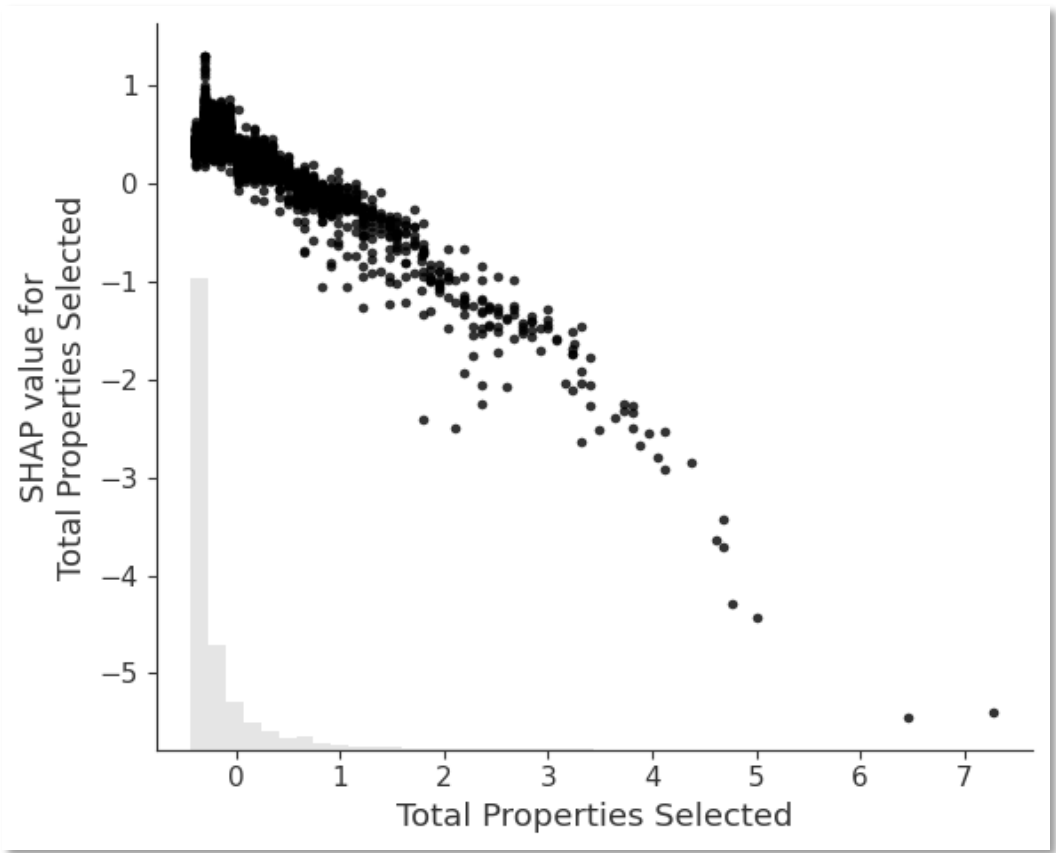
Positive Effect on Cluster 2 Assignment





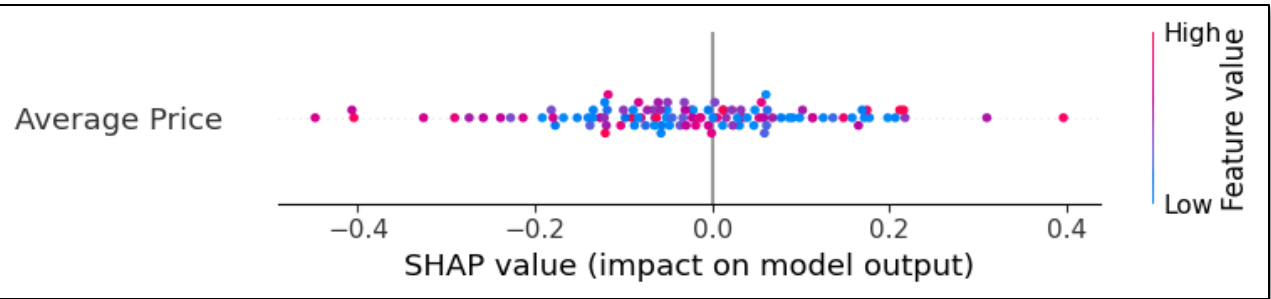
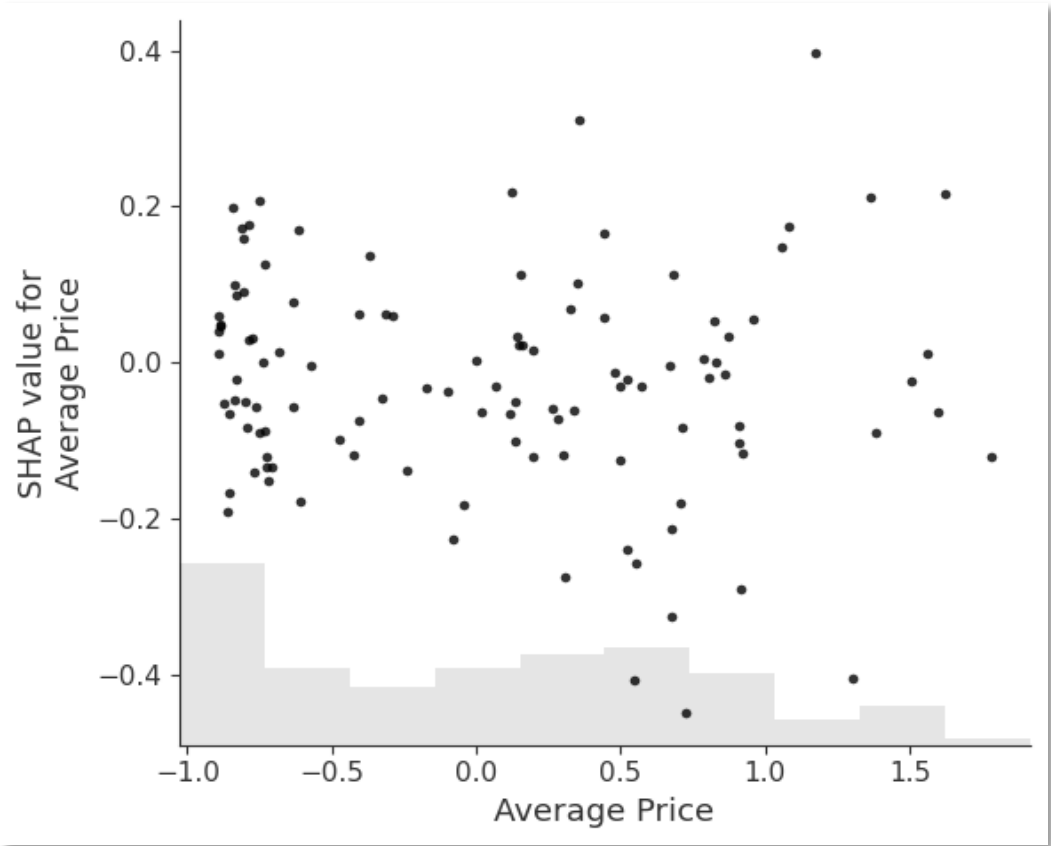
# Interpreting SHAP plots

Negative Effect on Cluster 4 Assignment

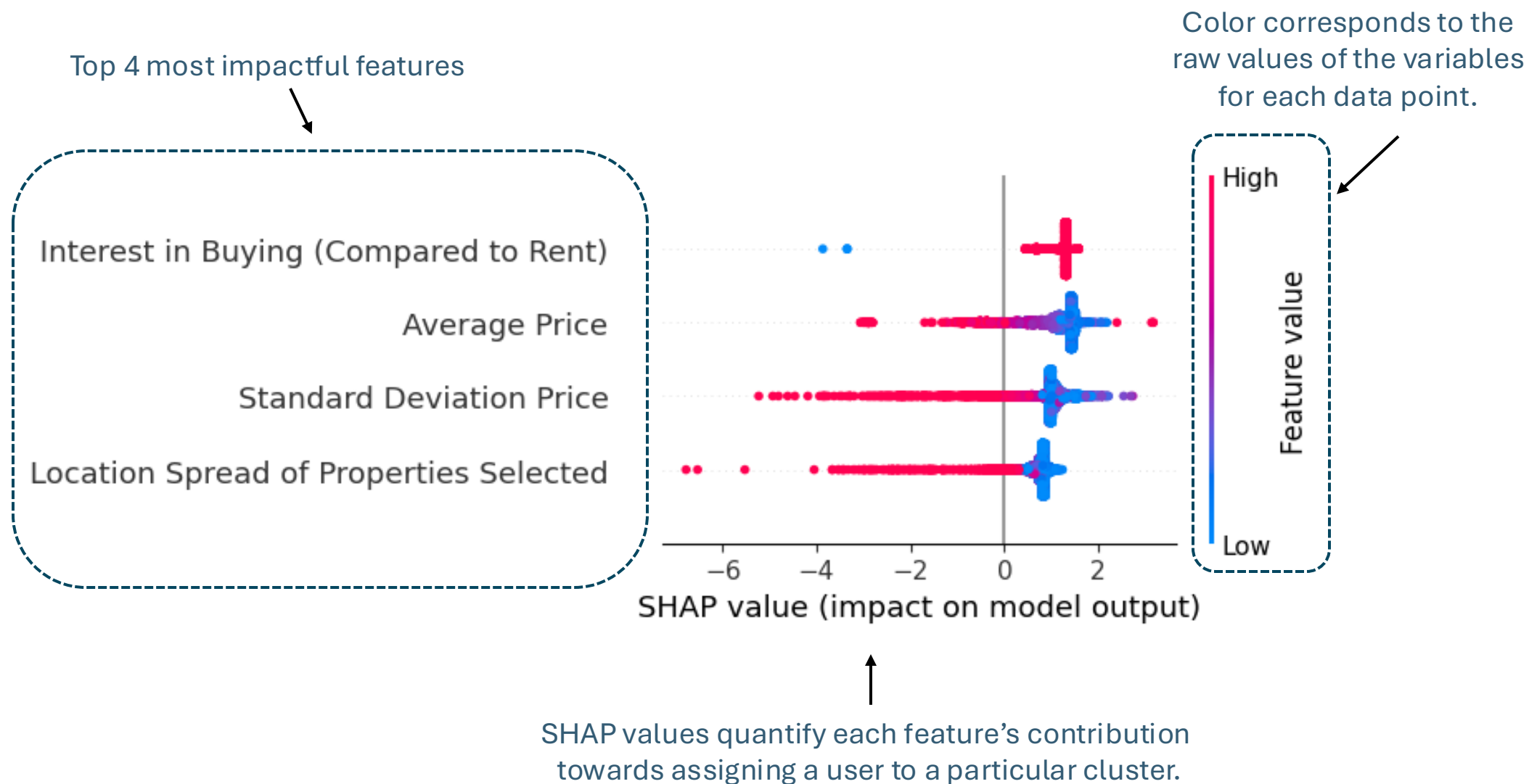


# Interpreting SHAP plots

Neutral Effect on Cluster 2 Assignment



# Interpreting SHAP plots



# Methodology Overview



1



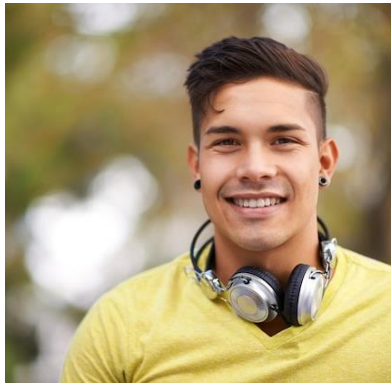
**Jose: ONE TIME BUYER**

2



**Ana: CLICKER**

3



**Juan: DREAMER**

4



**Sofia: MILLENNIALS**

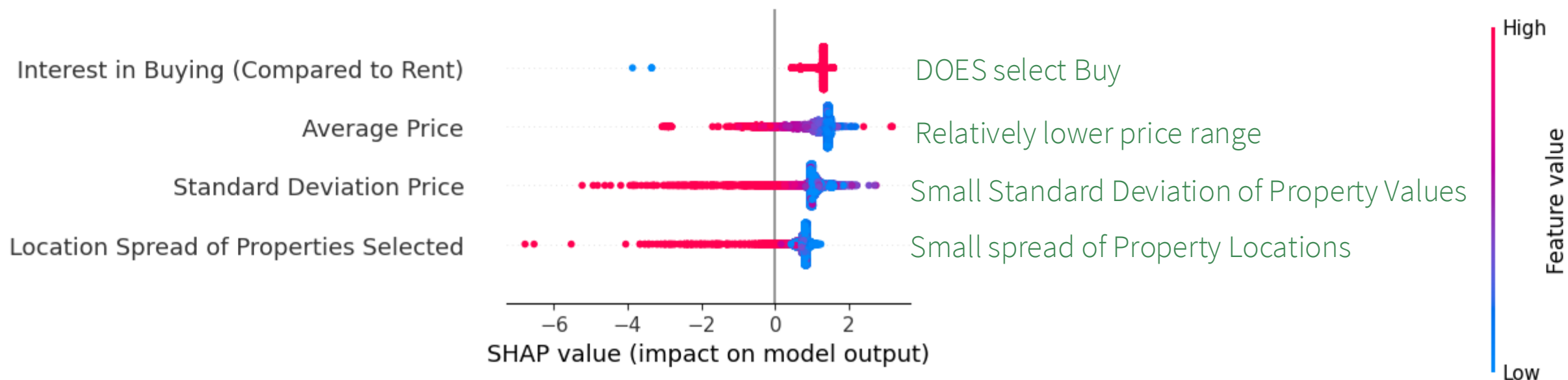
# Cluster 1: 53.4% of users: One Time Buyers



**Jose: ONE TIME BUYER**

## Who is José?

Jose is ready to **buy**! He has a **specific location** in mind and a **specific price range** he's looking for. The average **price** has higher **variability**, but be assured, Jose is NOT renting.



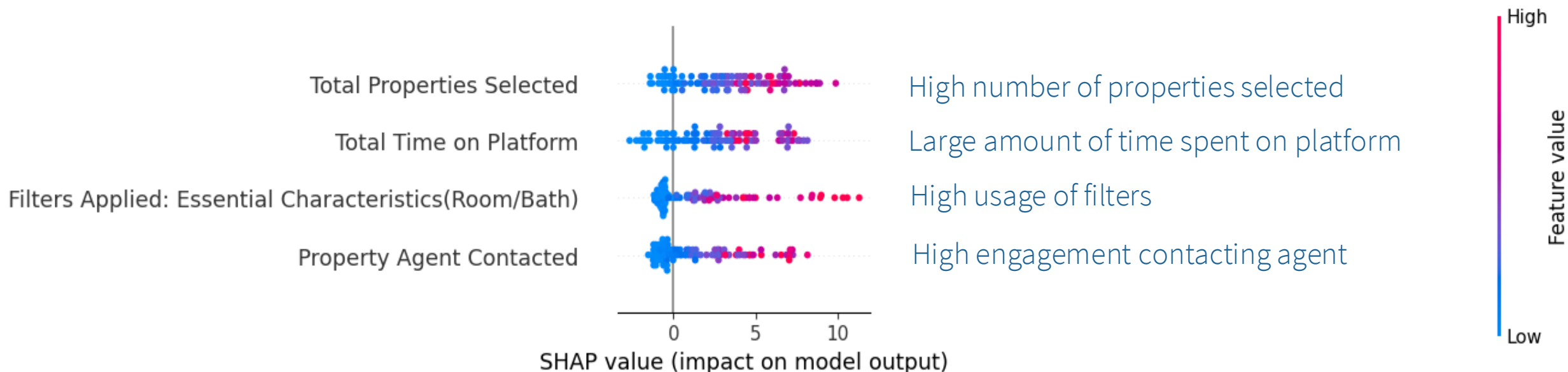
## Cluster 2: 0.7% of users: Clickers



Ana: CLICKER

### Who is Ana?

Ana is an active Monopolio user! She uses **all the filters** and clicks on a **wide range of property types**. The properties are not limited to a particular neighborhood. She probably contacts a realtor in the platform.





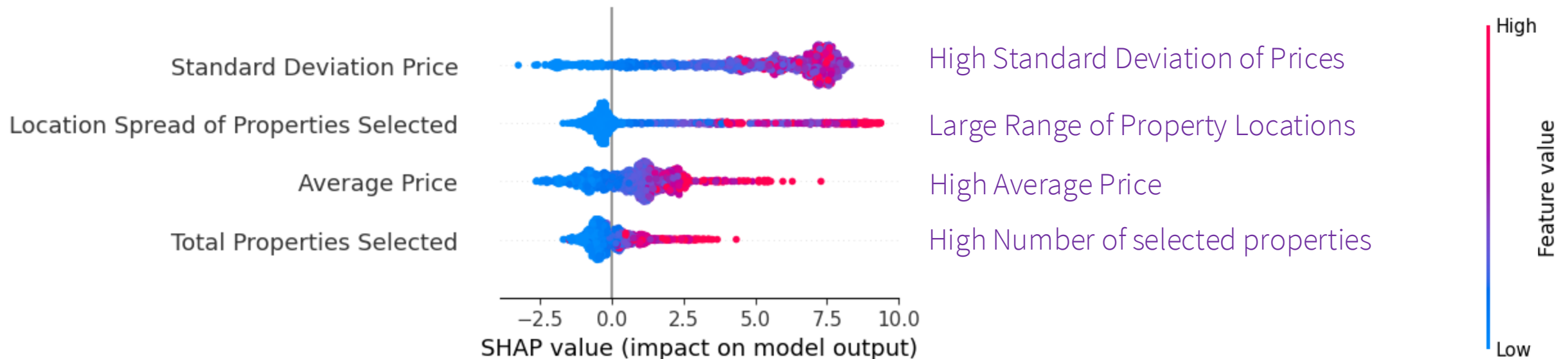
# Cluster 3: 8.3% of users: The Dreamers



**Juan: DREAMER**

## Who is Juan?

Juan is looking for properties all across Mexico and he doesn't care what the price is.



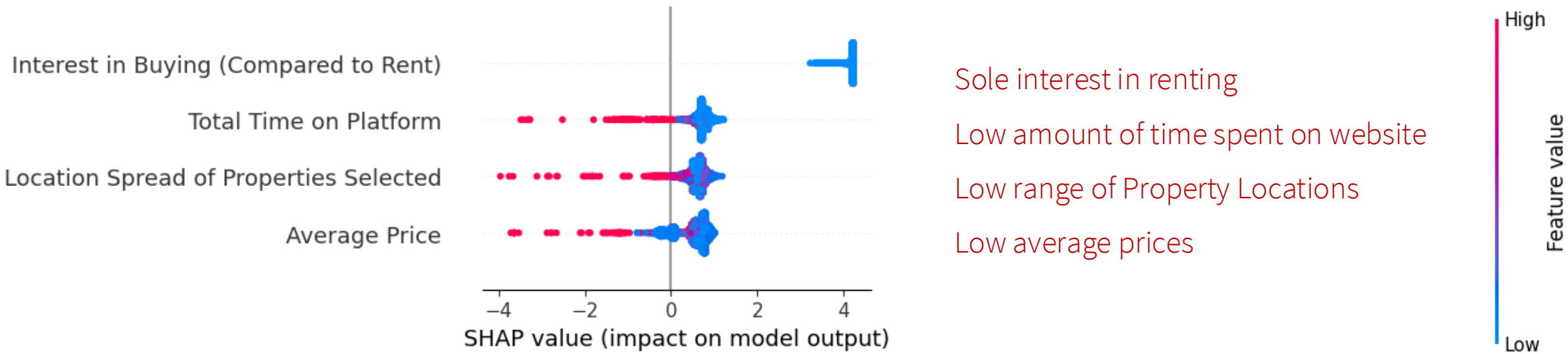
# Cluster 4: 37.5% of users: Millennials



**Sofia: MILLENNIAL**

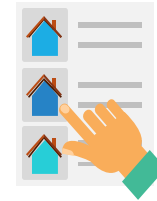
## Who is Sofia?

Sofia is exclusively a renter looking primarily in a **small centralized area**. This area has a **relatively lower average price**. Ana is NOT looking to buy.



- Sole interest in renting
- Low amount of time spent on website
- Low range of Property Locations
- Low average prices

# From user personas to actionable insights



- Targeted marketing campaigns



- Customer Retention & Personalization



- Pricing & Monetization Strategies



- A/B Testing & Experimentation

# Targeted marketing campaigns

Message   Insert   Format text   Draw   Options

↶ ↷ 📎 📧 Aptos 12 **B** *I* U ~~S~~ ⌵ ⋮ ✎ 🔗 🔗 🔗

➤ Send

José, Find Your Ideal Mortgage in Minutes! 🏡

Hi José,

We know you're ready to buy, and we're here to help you make it happen—**quickly!**

With **Compa**, you can:

- ✅ Find the best mortgage options tailored to your budget and location
- ✅ Simulate your credit instantly—at no cost!
- ✅ Get one step closer to owning your dream home

Click below to find your ideal mortgage today! 📌

**compa** See how much mortgage credit you can get in just 1 minute

Get pre-approved   View application   **compa**   Login

**Find the ideal mortgage for you in just a few minutes**

Simulate your credit at no cost and get the home of your dreams

Get pre-approved

Simulate your credit!

\$ Property value   MXN

\$ My net income   MXN

Select a term in years

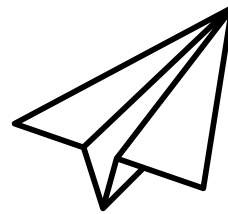
5   10   15   20

We can lend you up to

\$0.00MXN

With a monthly payment from

(Existing DD360 product)



**Jose: ONE TIME BUYER**

## Who is José?

Jose is ready to **buy**! He has a **specific location** in mind and a **specific price range** he's looking for. The average **price** has higher **variability**, but be assured, Jose is NOT renting.

# Thank you!

# monopolio

