



Business Case 3

Gift-a-lot Recommender System

ANDREIA, M20210604

JOÃO, M20211014

PAULINE, M20211019

TIAGO, M20210766



GROUP R



Agenda

What you'll learn about today

- Business Context
- Data Preparation
- Purchasing Pattern and customer Behaviour
- Result of the Models
 - Market Basket Analysis
 - Recommender System
 - Cold Start
- Deployment and Business Recommendations





Business Context

UK-based
non-store
online
retailer

Rec system
becomes an
indispensable
tool

Exponential
expansion of
alternative
product
choices

Data Preparation

01

COHERENCE CHECK

- Dropped all cancellations
- Deleted all rows with lower case descriptions
- Dropped administrative charges

02

FEATURE ENGINEERING

- Split 'invoiceDate' into day month and year
- New variable 'TotalPrice'(quantity * price)

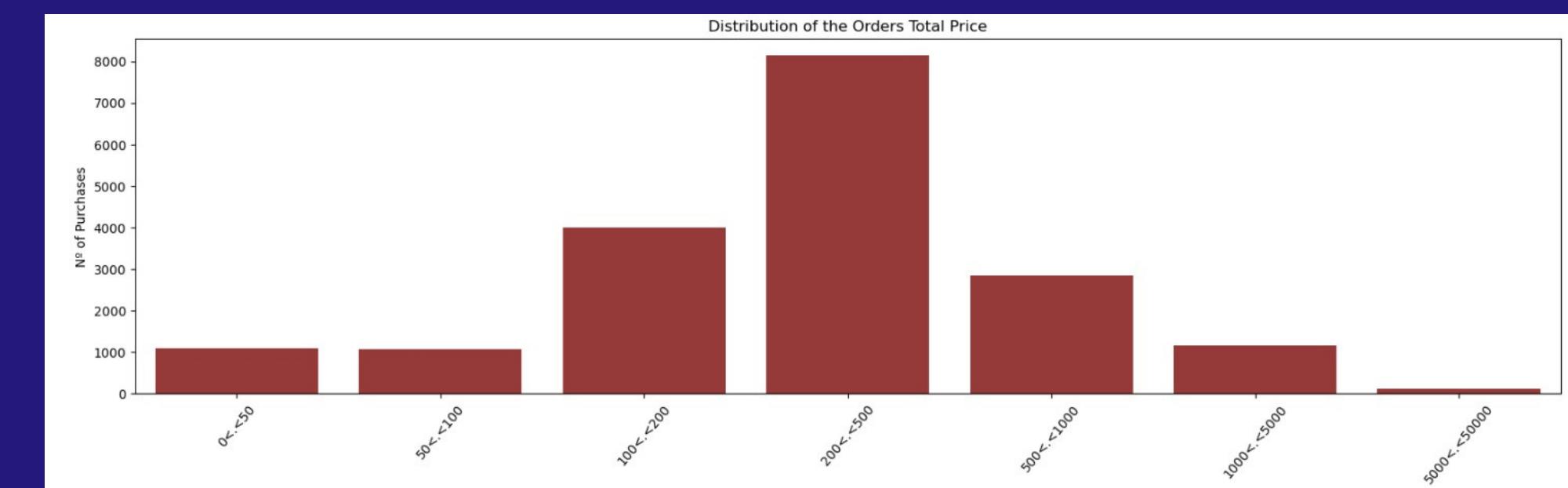
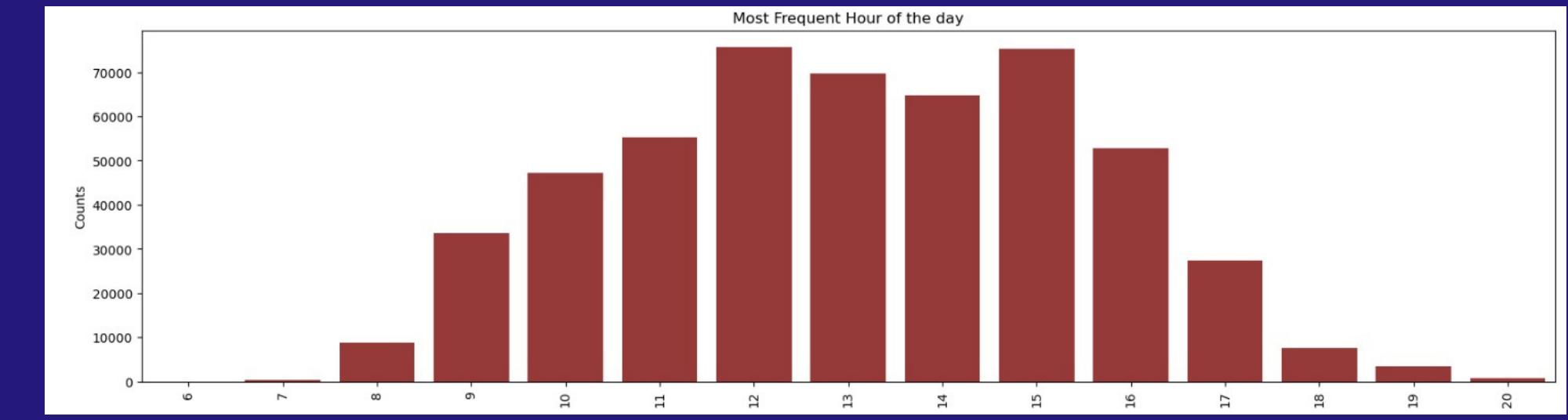
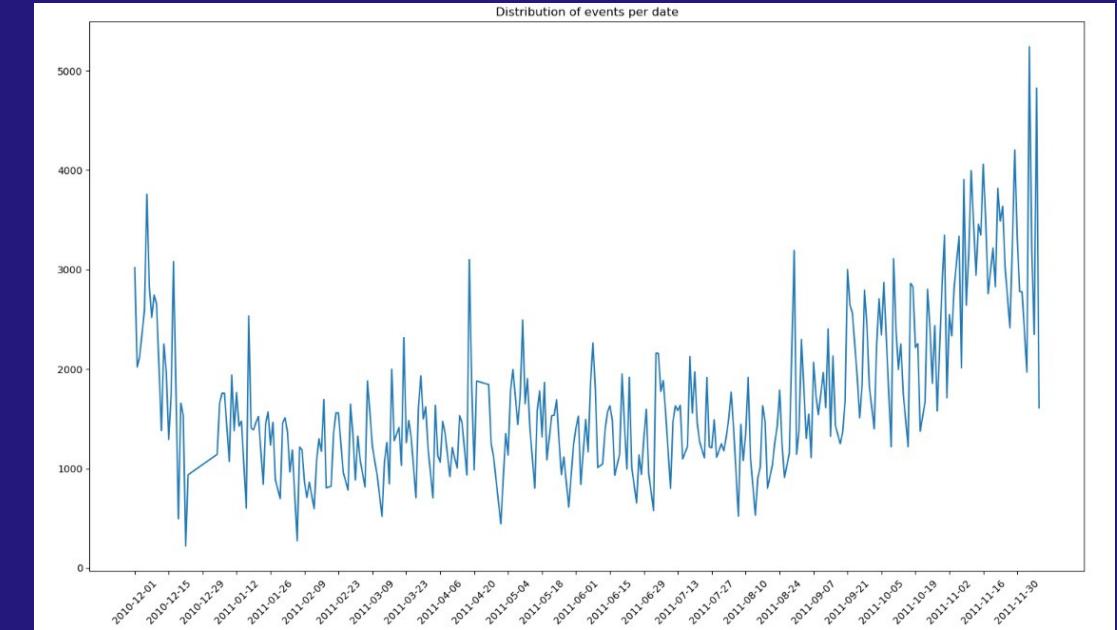
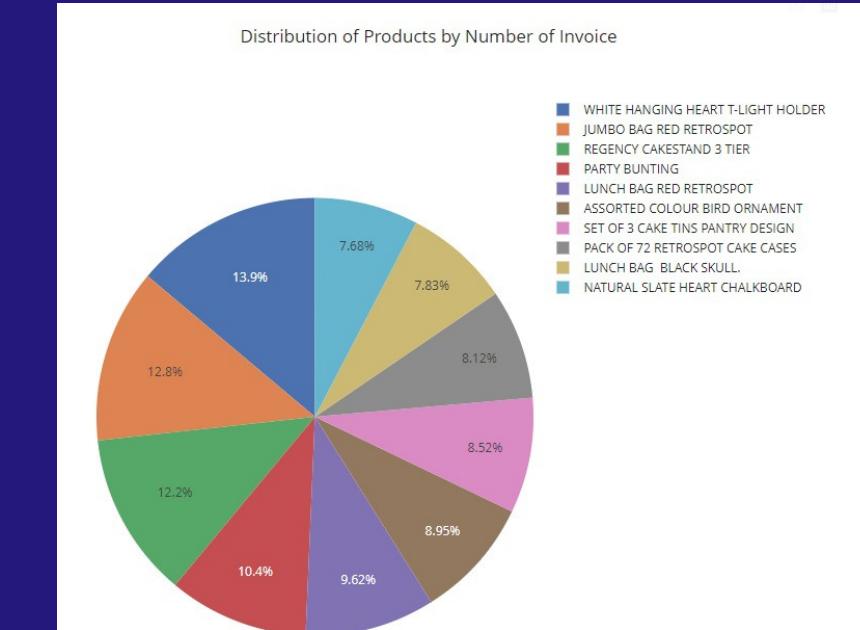
03

POSITIVE TRANSACTIONS ONLY

- Negative values = cancelled transaction
- Focus on items actually bought => positive Quantity
- Same logic for UnitPrice

Purchasing Pattern

- UK accounts for 92.2% of all transactions
- Top 10 gifts that are the most popular
- Patterns of seasonality:
Increase in WinterTime
Activity between 12 and 3pm



Customer Behaviour

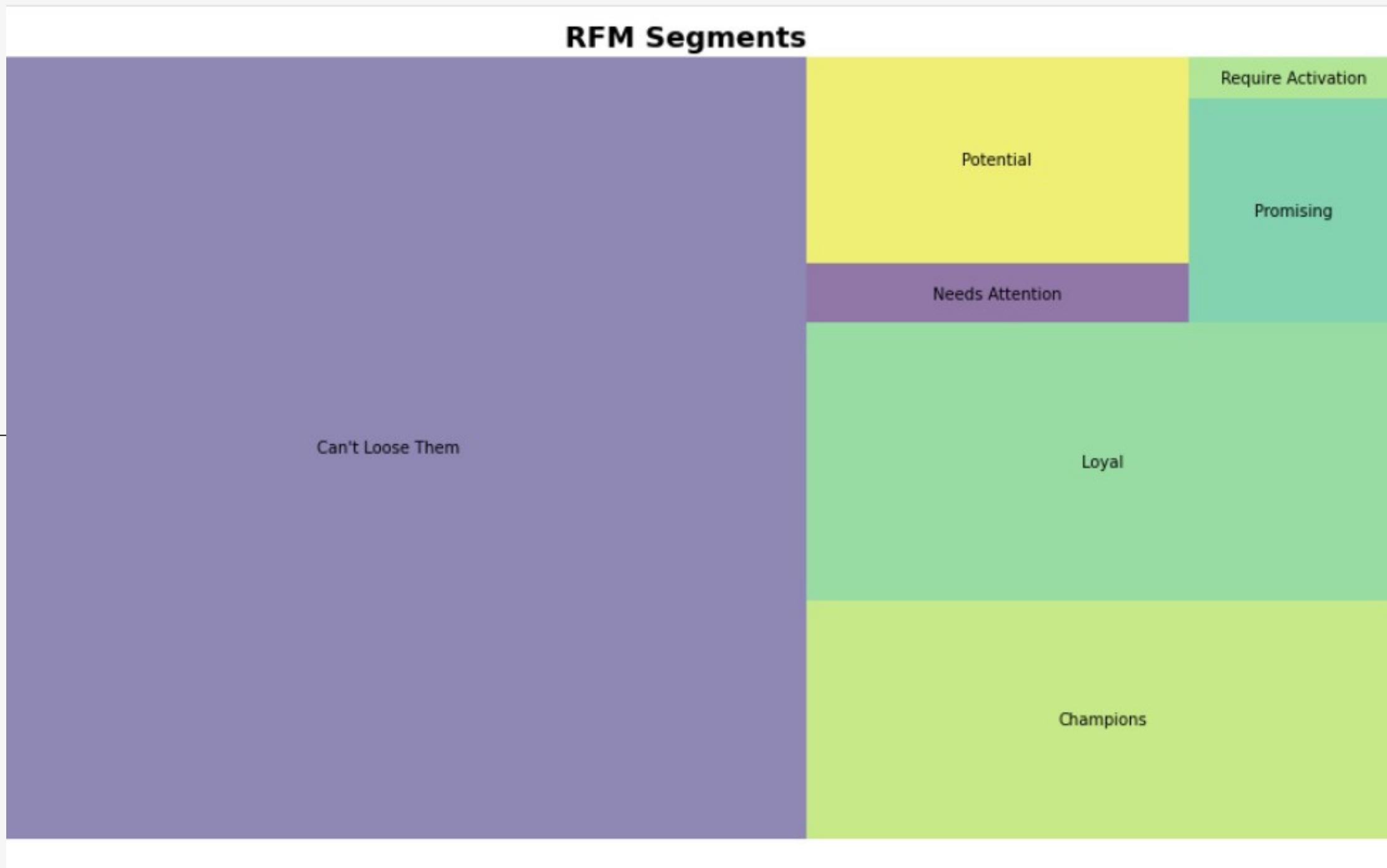
RFM analysis

Can't Loose Them (2531 customers)

→ purchasing expenses 3118€

Require Activation (35 customers)

→ purchasing expenses 143€



Results

1. Market Basket Analysis
2. Recommender System
3. Cold start

1. Market Basket Analysis

What ?

Analysis divided in 2: one for the UK, one for the Rest of the World

We generated frequent items, using the Apriori Algorithm with a support of 3%,

Association Rule

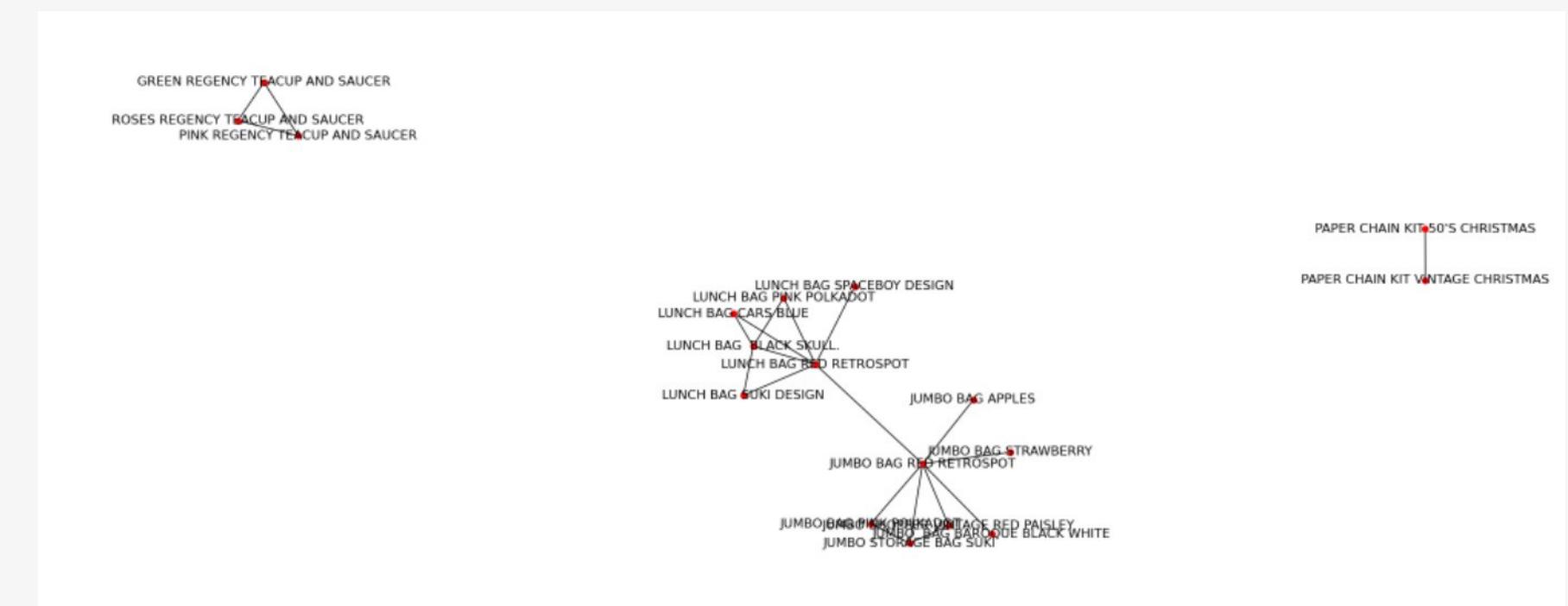
3 metrics to consider: Support, Lift and Confidence

UK example: GREEN REGENCY TEACUP AND SAUCER and PINK REGENCY TEACUP AND SAUCER have the highest lift (14,609), support value of 0,0349 and confidence of 0,618

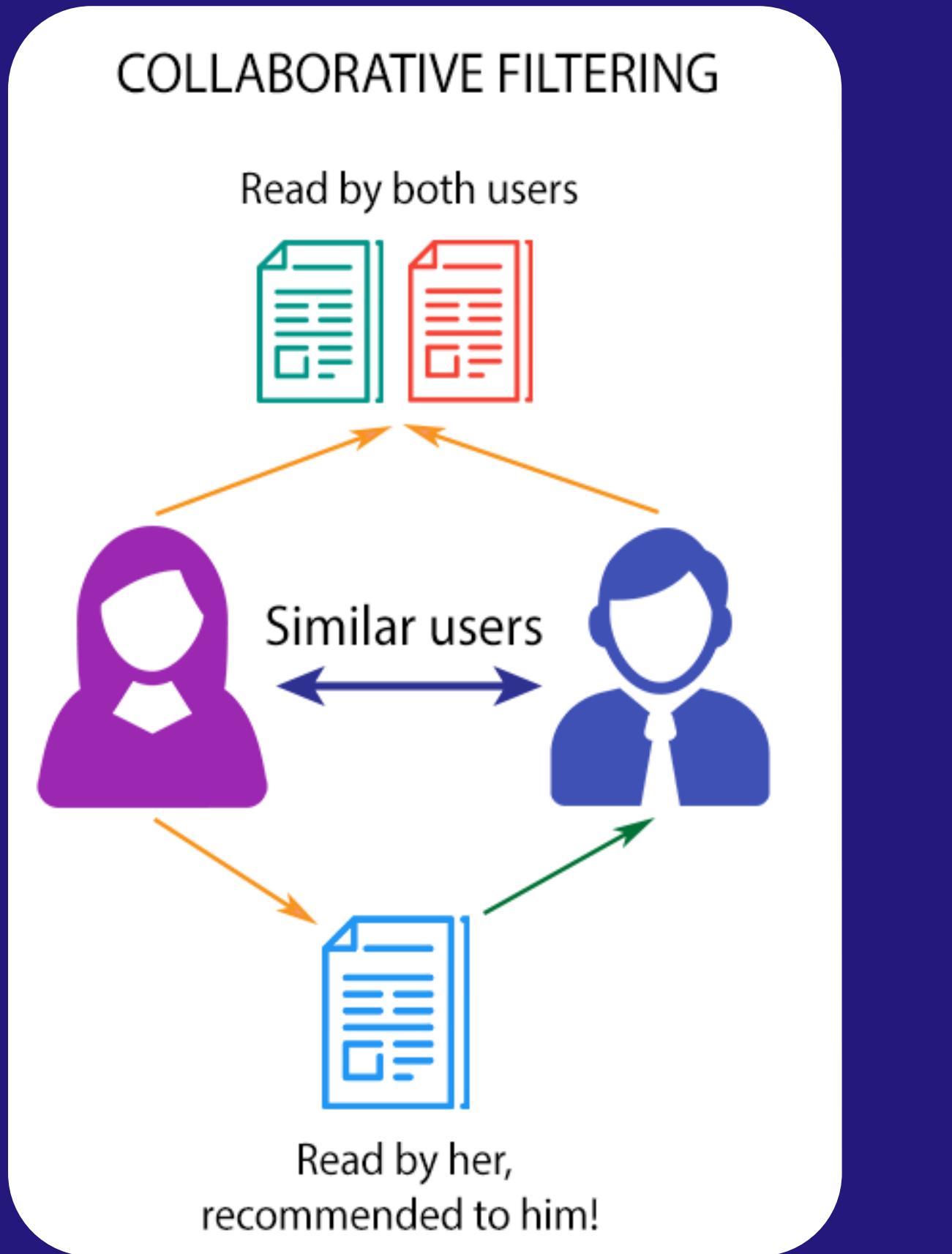
Results

177 (UK) and 61 (Rest of The world) transactions are considered as frequently bought items

Most Frequently item bought for UK: WHITE HANGING HEART T-LIGHT HOLDER (2 325 times)



2. Recommender System



First step: deal with Data Sparsity
HOW? set up a threshold for the minimum user-item interactions

Matrix factorization algorithm:
Alternating Least Squares

Combining the two functions,
`cold_start` and `rec_sys`, we created our recommendation system

3.Cold Start

How do we deal with new customers?

Popularity based Technique:

- 2 inputs

COUNTRY

CURRENT MONTH

- 5-product suggestion

4 TOP SALES

1 WORST SALE

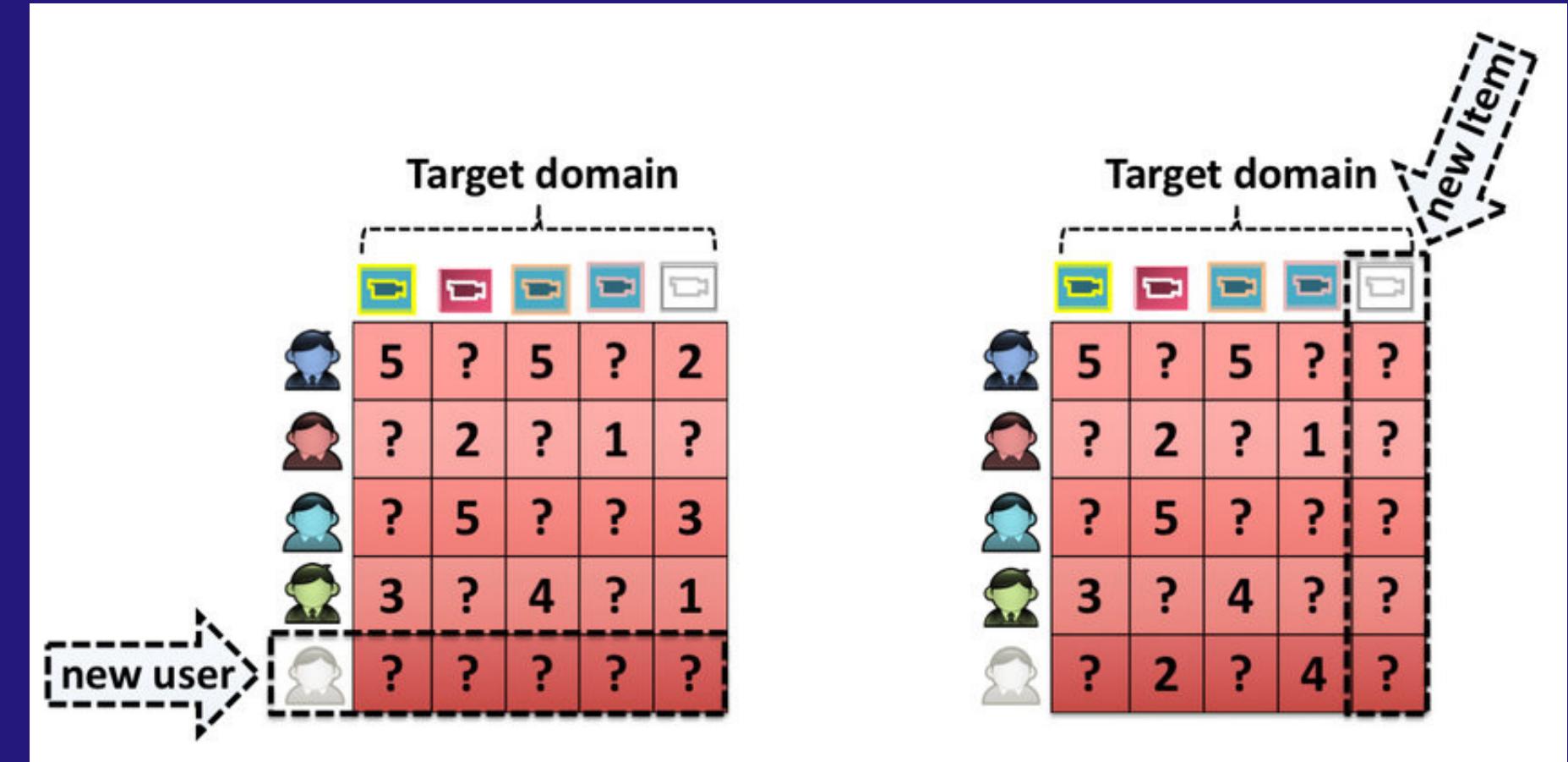
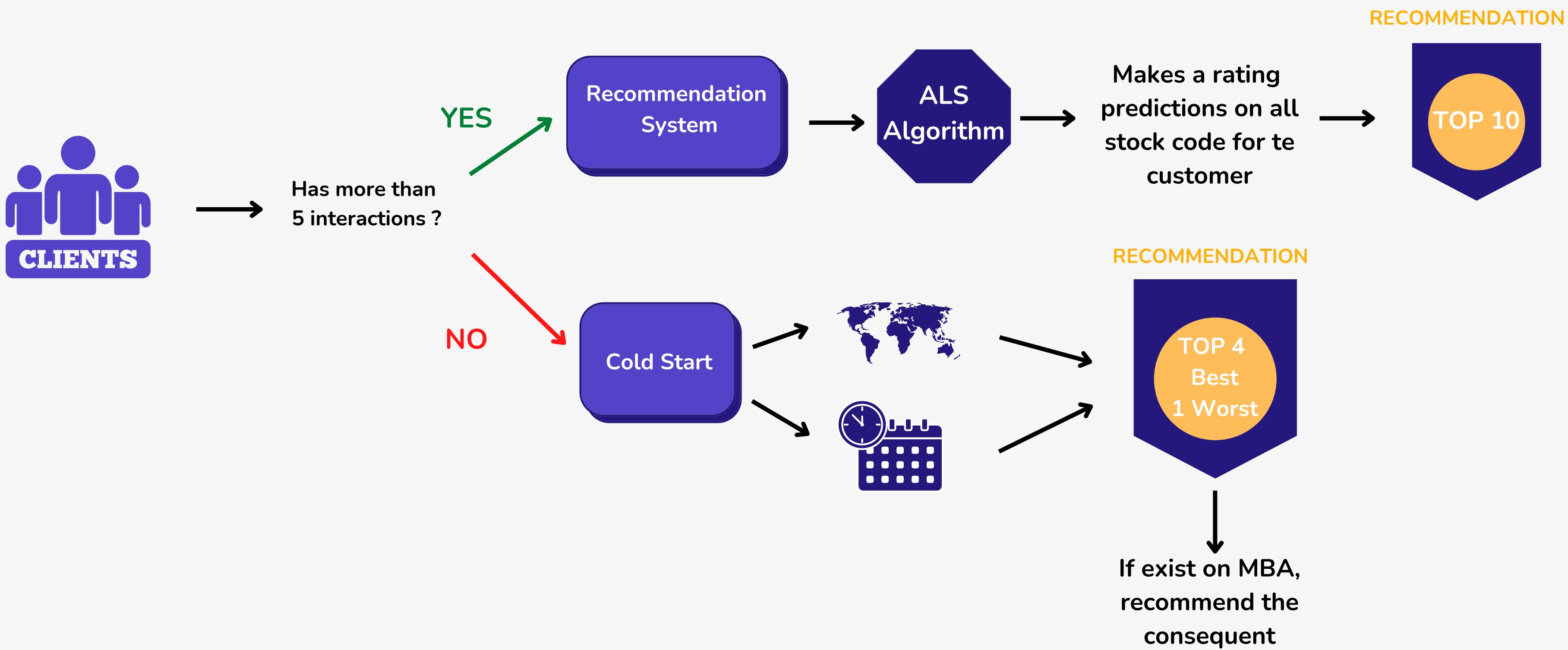


ILLUSTRATION OF THE COLD START PROCESS

To summarize....



Deployment and Business Application

01 DISCOUNT AND RECOMMENDATIONS

Pop-up recommendation or discounts on the consequent items. **WHY?** use the success of one product, and increase the purchase of other item

02 GROUPING GIFTS

Regroup Items together with a lower price than if the two items were bought individually at the same time. **WHY?** Encourage to buy more.

03 ASSOCIATION RULES

Display items that are highly associated next to each other on the website. **WHY?** Attract the attention of the client on a second item to buy

Conclusion



COLLABORATIVE-FILTERING STRATEGY



LIMITATION TO OUR WORK



FINAL OUTPUT WITH SIMPLE DATASET



SE EXPLICIT DATA TO CREATE A MORE RELIABLE RECOMMENDATION



**Thank you
for listening!**

**Feel free to share your questions with the
team**