



## 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

Exponential  
expansion of  
alternative  
product  
choices

Rec system  
becomes an  
indispensable  
tool

# 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 )

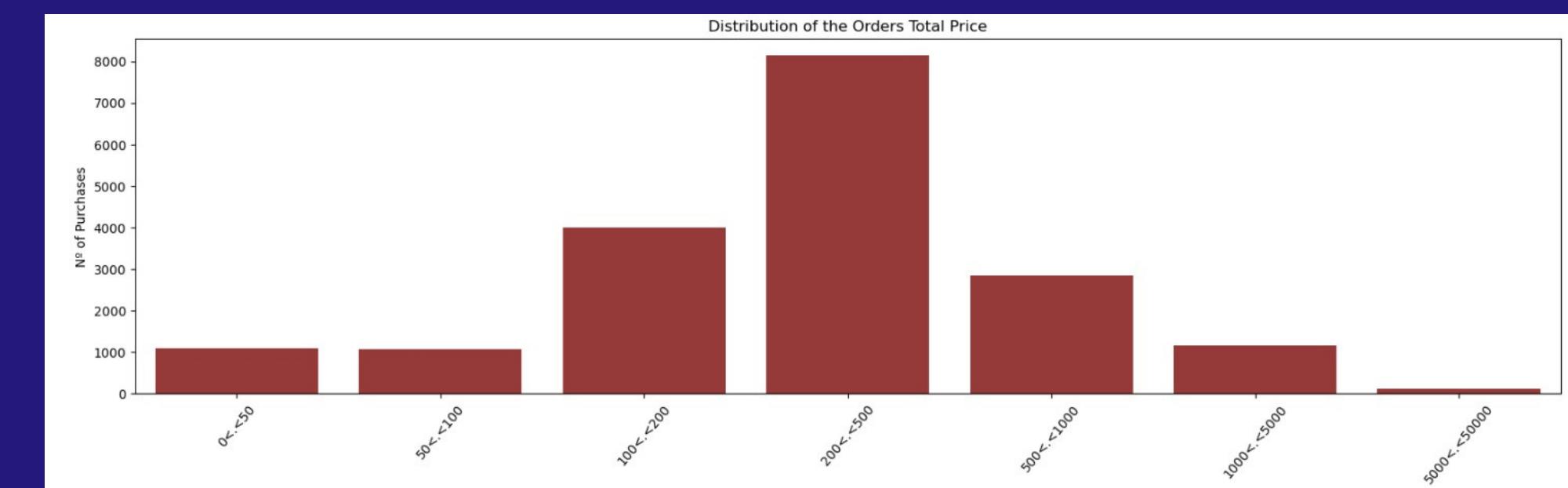
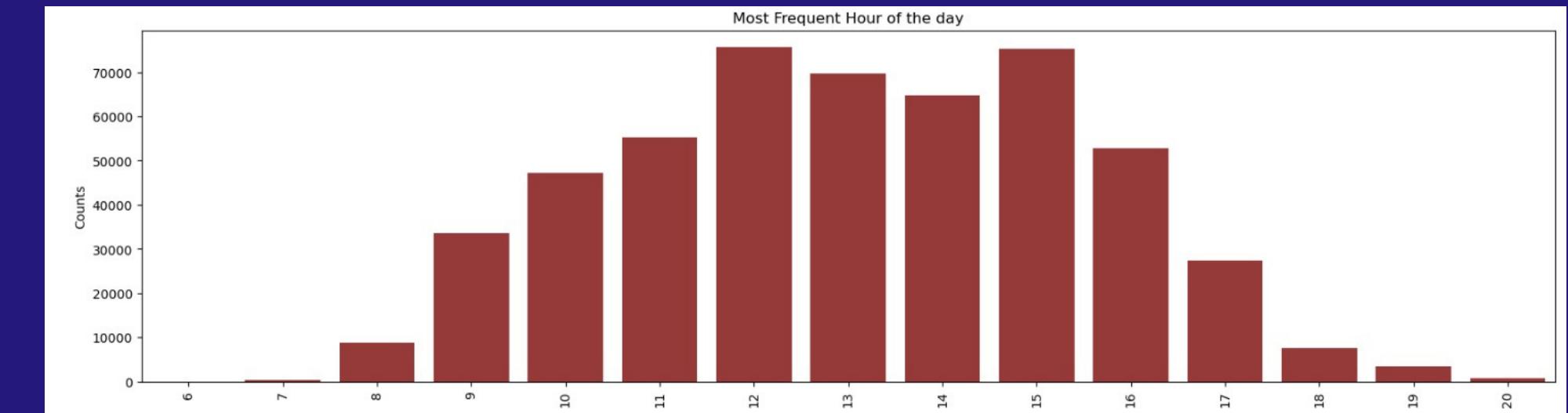
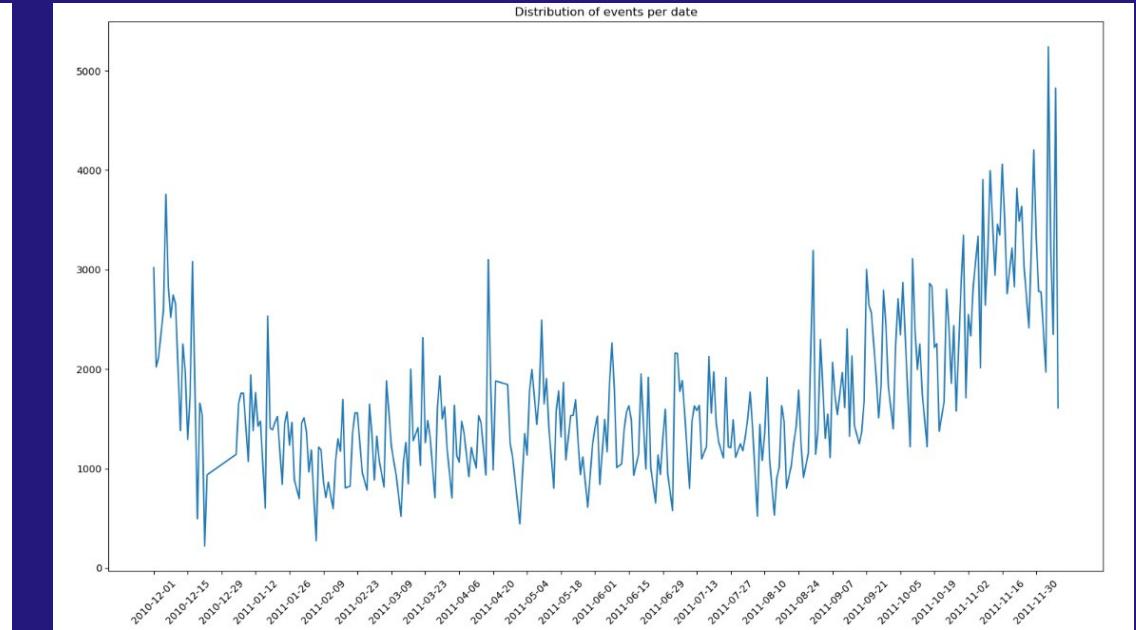
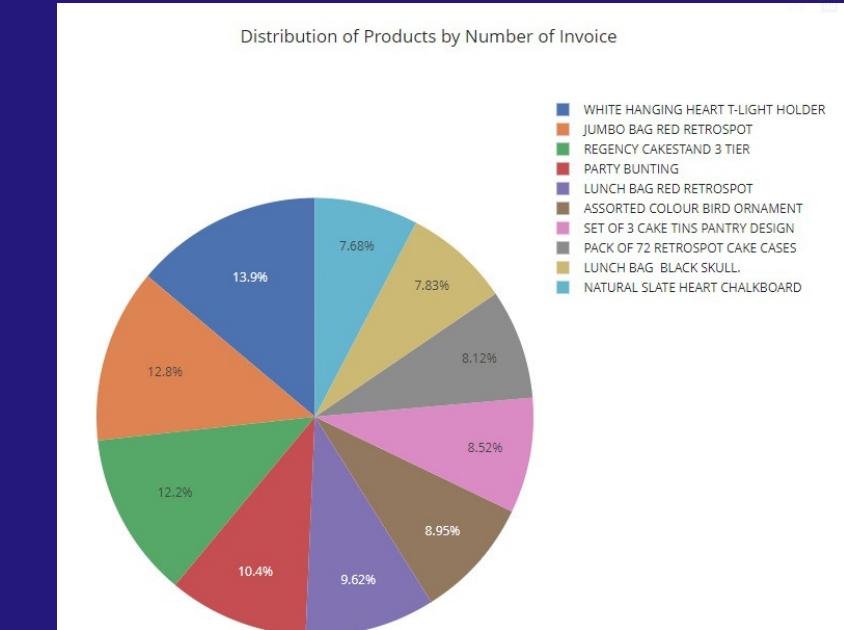
03

## 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

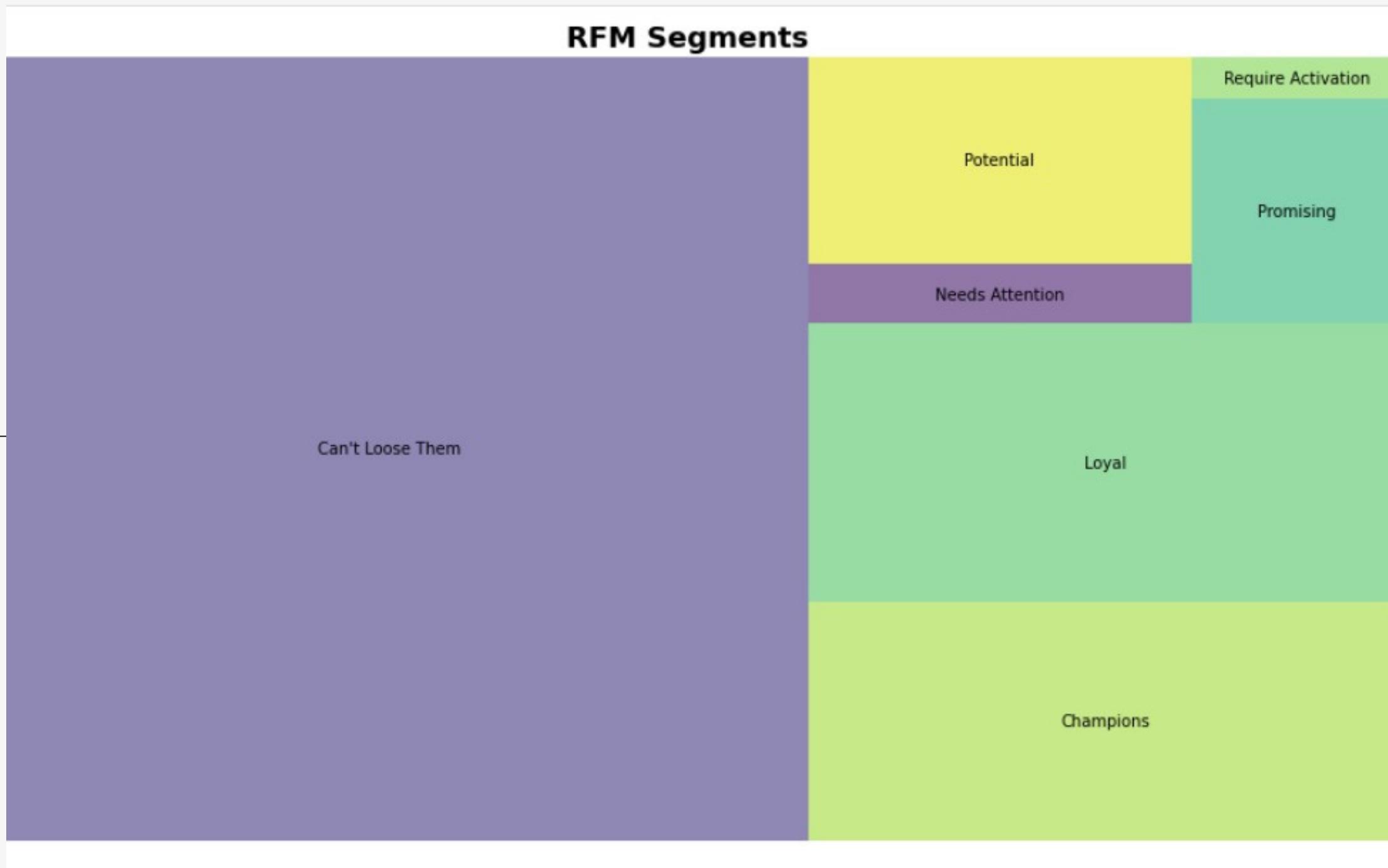
## RFM analysis

**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

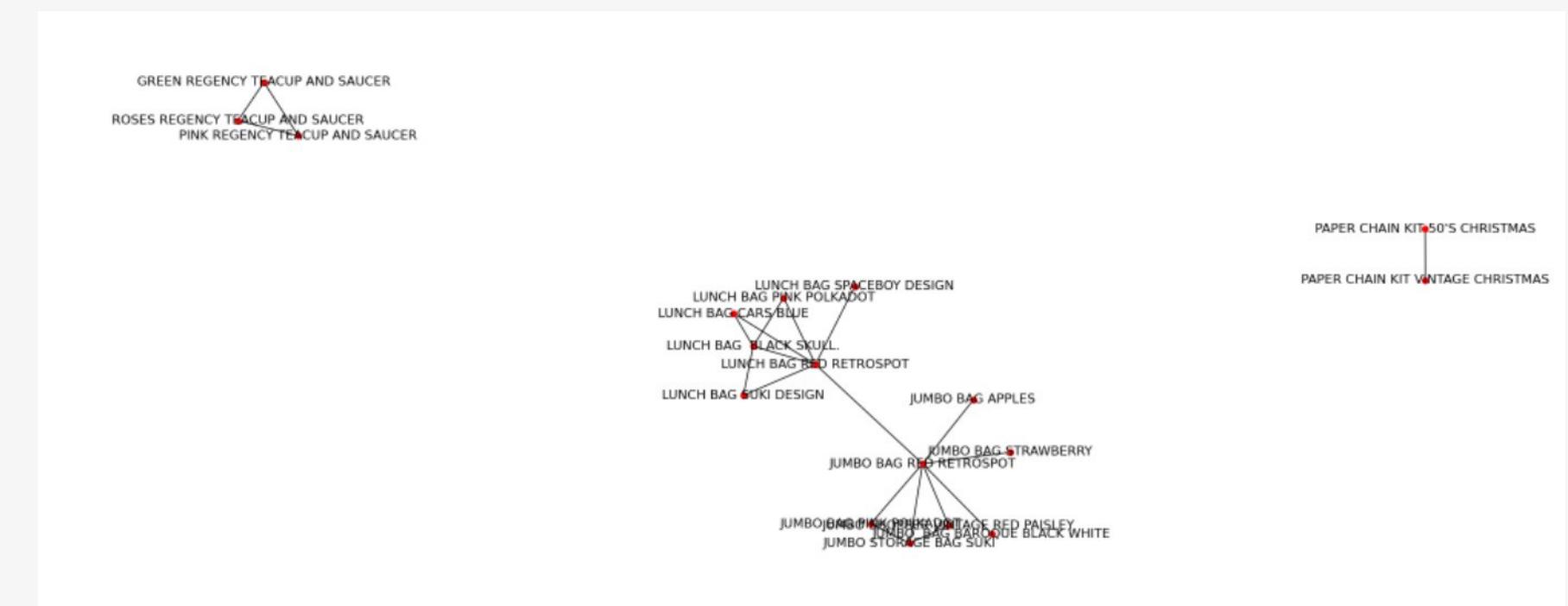
3 metrics to consider: Support, Lift and Confidence

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

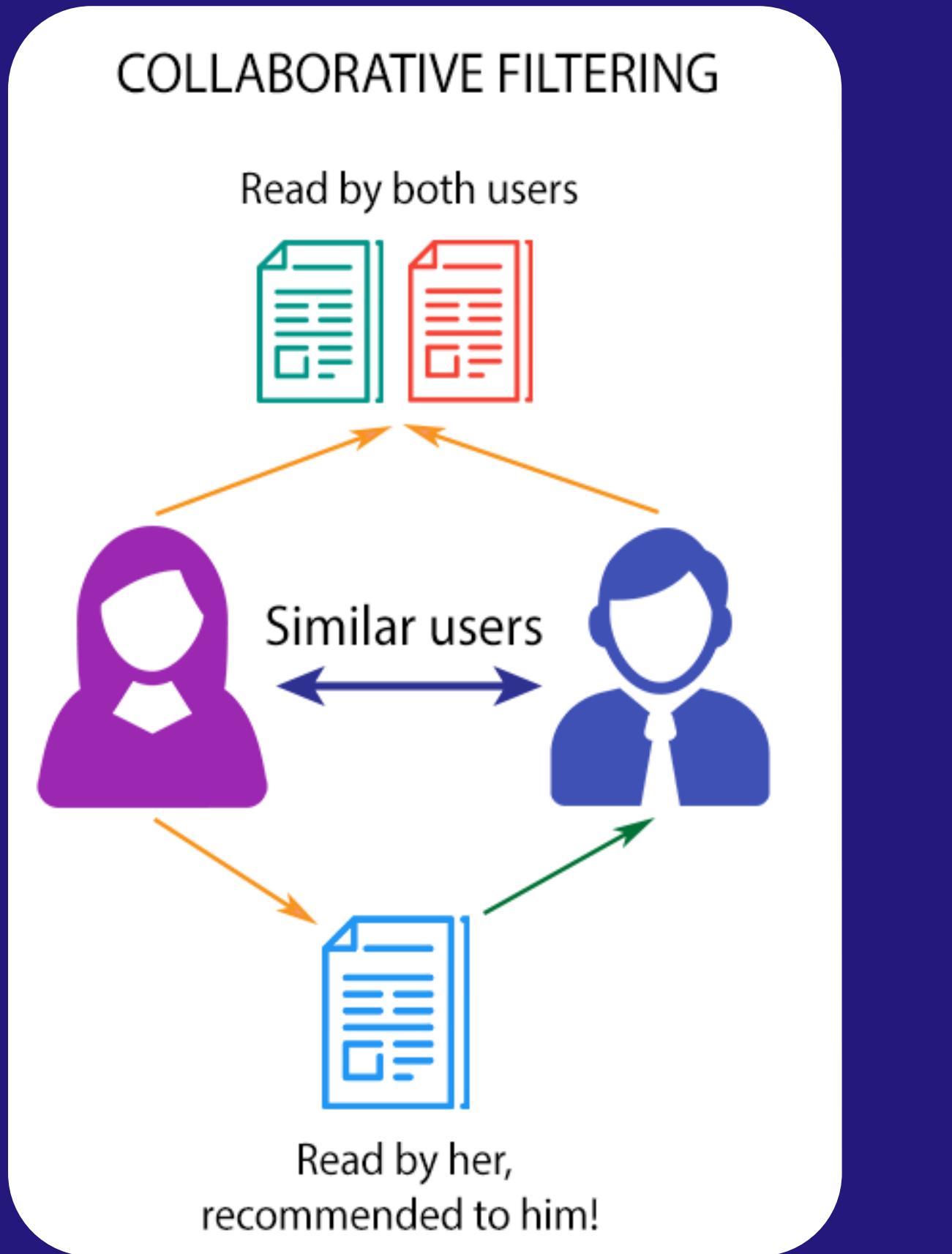
## Results

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

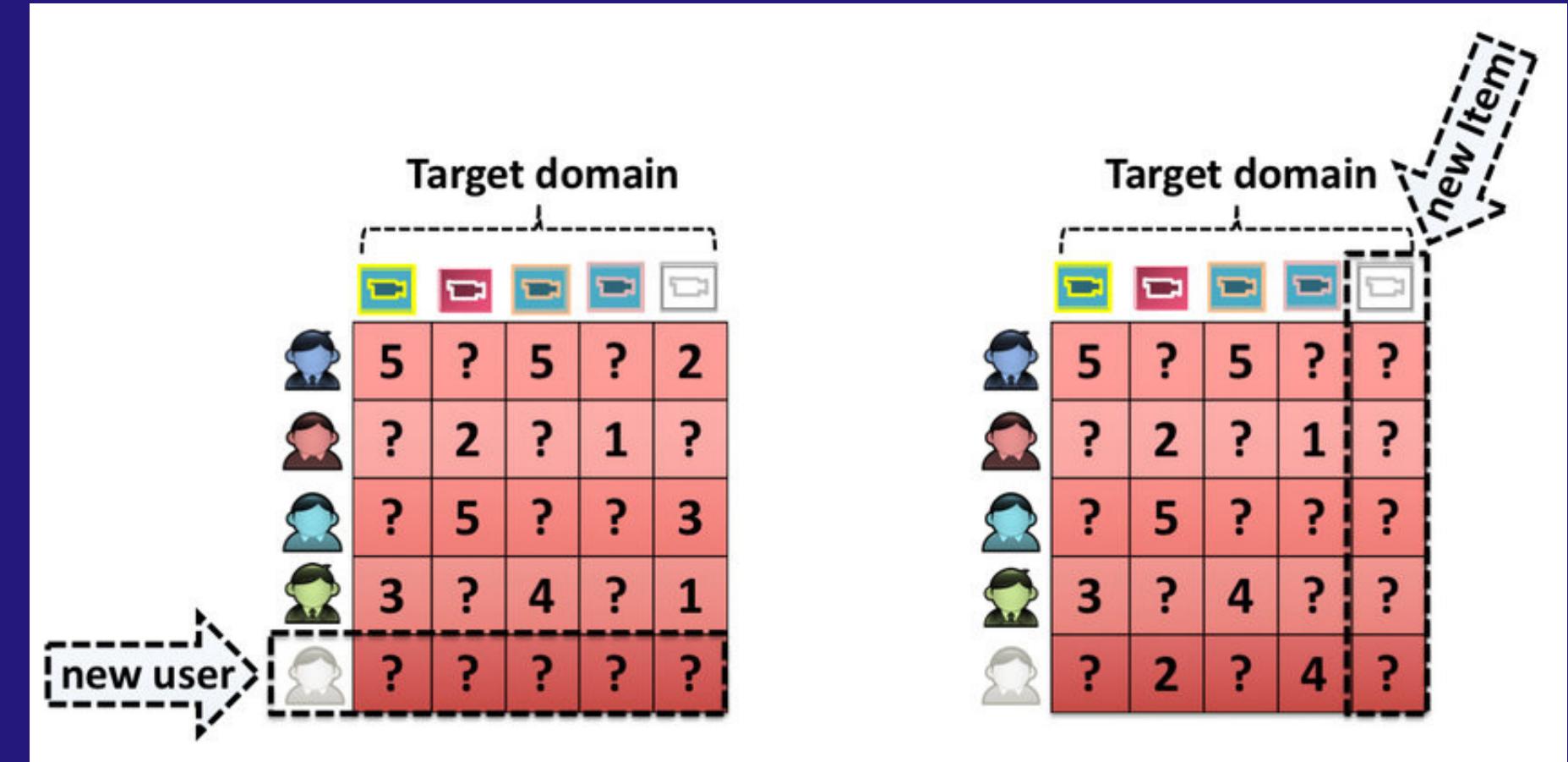


ILLUSTRATION OF THE COLD START PROCESS

# 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**