

# The market basket analysis of Nexus



---

COURSE: CAPSTONE: CREATE VALUE FROM OPEN DATA

STUDENT: NINO POŽAR

**2.5 MIL. € SALES  
INCOME**



**nexus**

**112% ROI**



**15% MORE  
SALES**



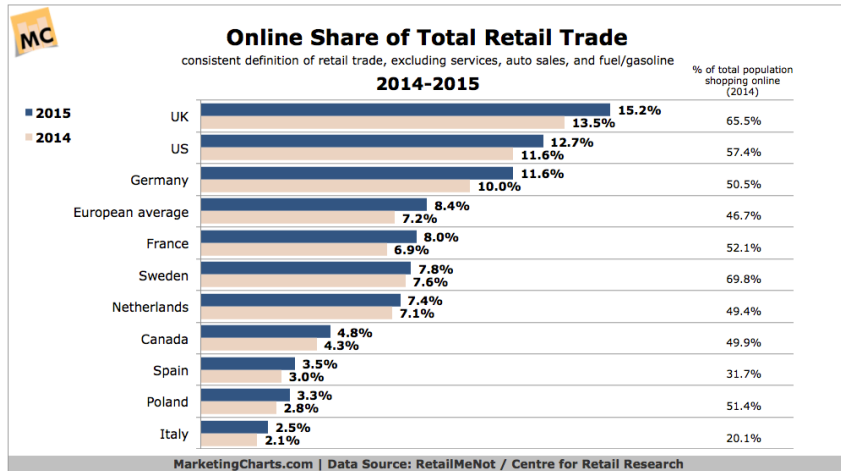
Nexus is a UK-based and registered non-store online retail. The company mainly sells unique all-occasion gifts.

The management of company is not satisfied with current amount of sales and believe they can improve them by using analytics approach.

The company wants to improve it's sales and earnings by introducing recommender system that will group similar items together.

By introducing the system, Nexus wants to gain much needed competitive advantage.

At average, if online retail company successfully implements market-basket-based recommender systems, sales improve about 15%, with ROI at average of 112%.

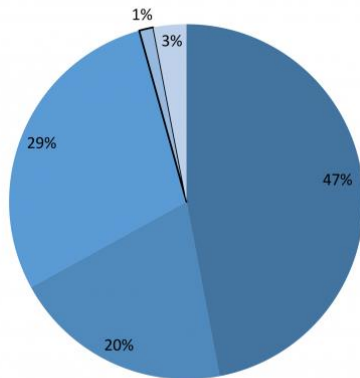


Available at: <https://www.marketingcharts.com/industries/retail-and-e-commerce-53439>

#### Market Share For Online Retailers

China, 2016

■ Alibaba ■ JD.com ■ Other Retailers ■ Amazon ■ VIP



Source: Euromonitor, The Wall Street Journal

BI INTELLIGENCE

Available at: <https://www.businessinsider.com/amazon-is-struggling-to-find-its-place-china-2017-8>

# Market situation

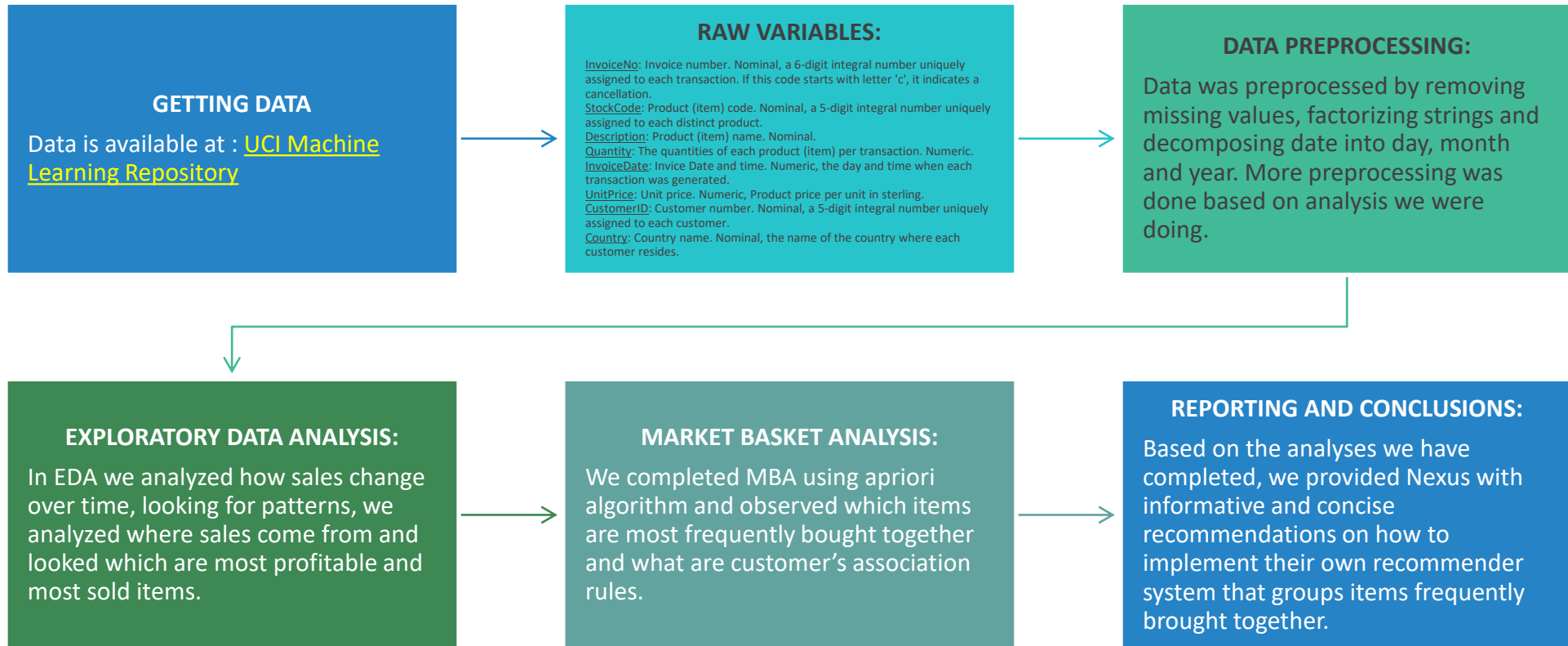
The number of online share of total retail is growing, specially in the UK where in 2015 15.2% of retail happens online.

„Big guys” on market are still Alibaba, JD and Amazon.

Nexus must implement analytics to compete with top retailers.

Key to improve sales is to become customer centric, and by applying analytics, Nexus can achieve that.

# Data and analysis framework



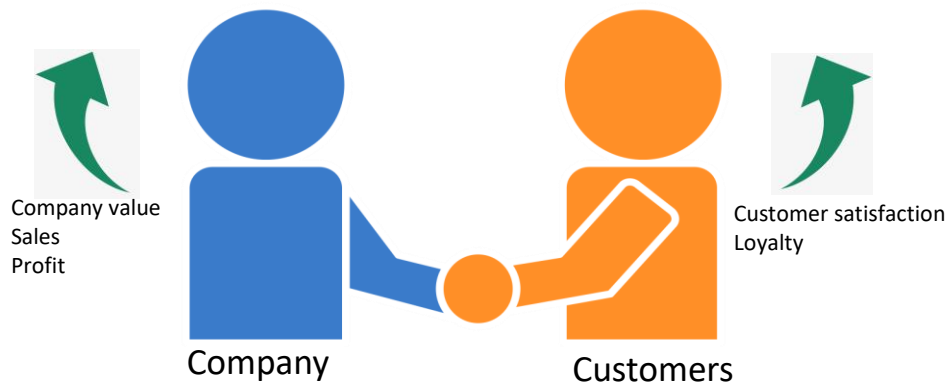
Ⓜ craigslist

ebay

amazon

# Market basket analysis

- MBA is one of the key techniques used by large retailers to uncover associations between items.
- Association rules are widely used to analyze retail basket or transaction data, and are intended to identify strong rules discovered in transaction data using measures of interestingness, based on the concept of strong rules.
- For a online retail company such as Nexus, this kind of analysis is of utmost importance. Companies that understand it's customers and their online behavior have big competitive advantage.
- Online retail companies such as Craigslist, E-Bay and Amazon are great examples of companies that utilized MBA to become leaders in the field.
- MBA can be conducted in R using apriori algorithm.
- Both stakeholders, the company and customer gain value from the implementation of MBA findings.

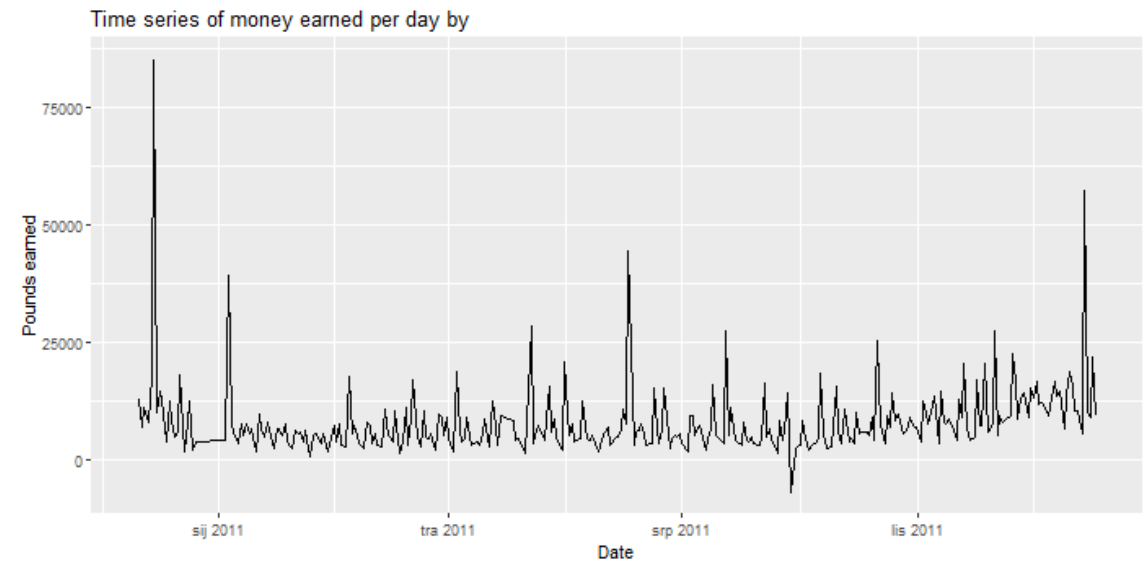


# Overall sales of Nexus

Management is not satisfied with current sales.

## CONCLUSIONS ABOUT DAILY SALES

- Sales are pretty much static over the year
- There are clear patterns of increased sales, specially around holidays in December
- There is lower amount of sales on weekends, which is expected since Nexus does not accept orders on Saturdays or Sunday mornings



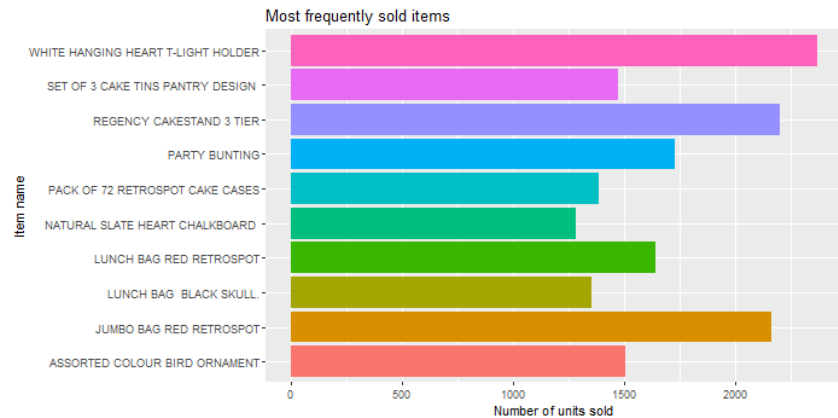
**THE GOAL IS TO IMPROVE SALES AND GAIN PROFIT!**

Table 1. Amount of sales par day of the week

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
94933	101516	94246	103550	81835	0	64375

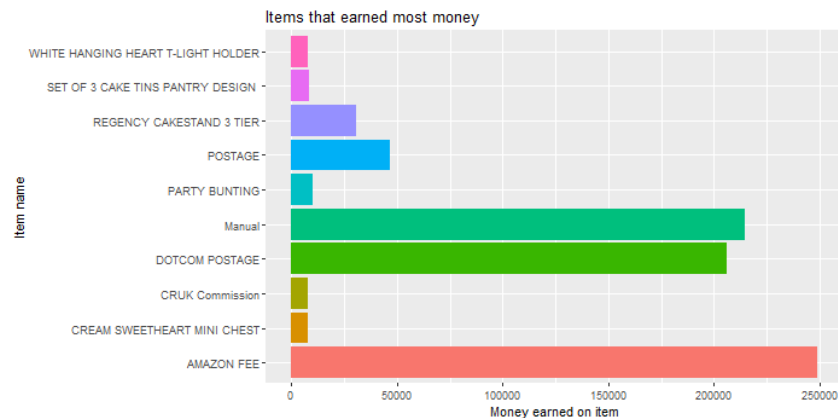
# Exploratory Data Analysis

JUMBO BAG BAROQUE BLACK WHITE  
 REX CASH+CARRY JUMBO SHOPPER  
 ALARM CLOCK BAKELIKE GREEN  
 ROSES REGENCY TEACUP AND SAUCER  
 LUNCH BAG SPACEBOY DESIGN  
 JUMBO SHOPPER VINTAGE RED PAISLEY  
 JAM MAKING SET WITH JARS  
 JUMBO BAG PINK POLKADOT  
 SET OF 3 REGENCY CAKE TINS  
 VICTORIAN GLASS HANGING T-LIGHT  
 SET OF 3 CAKE TINS PANTRY DESIGN  
 PARTY BUNTING  
 RED RETROSPOT CHARLOTTE BAG  
 REGENCY CAKESTAND 3 TIER  
 WHITE HANGING HEART T-LIGHT HOLDER  
 JUMBO BAG RED RETROSPOT  
 JUMBO BAG ALPHABET  
 ALARM CLOCK BAKELIKE RED  
 LUNCH BAG SUKI DESIGN  
 8 RIBBONS RUSTIC CHARM  
 SPOTTY BUNTING  
 RETROSPOT TEA SET CERAMIC 11 PC  
 LUNCH BAG CARS BLUE  
 BAKING SET 9 PIECE RETROSPOT  
 SPACEBOY LUNCH BOX  
 SET OF 4 PANTRY JELLY MOULDS  
 WOODEN PICTURE FRAME WHITE FINISH  
 SET/20 RED RETROSPOT PAPER NAPKINS  
 GARDENERS KNEELING PAD KEEP CALM



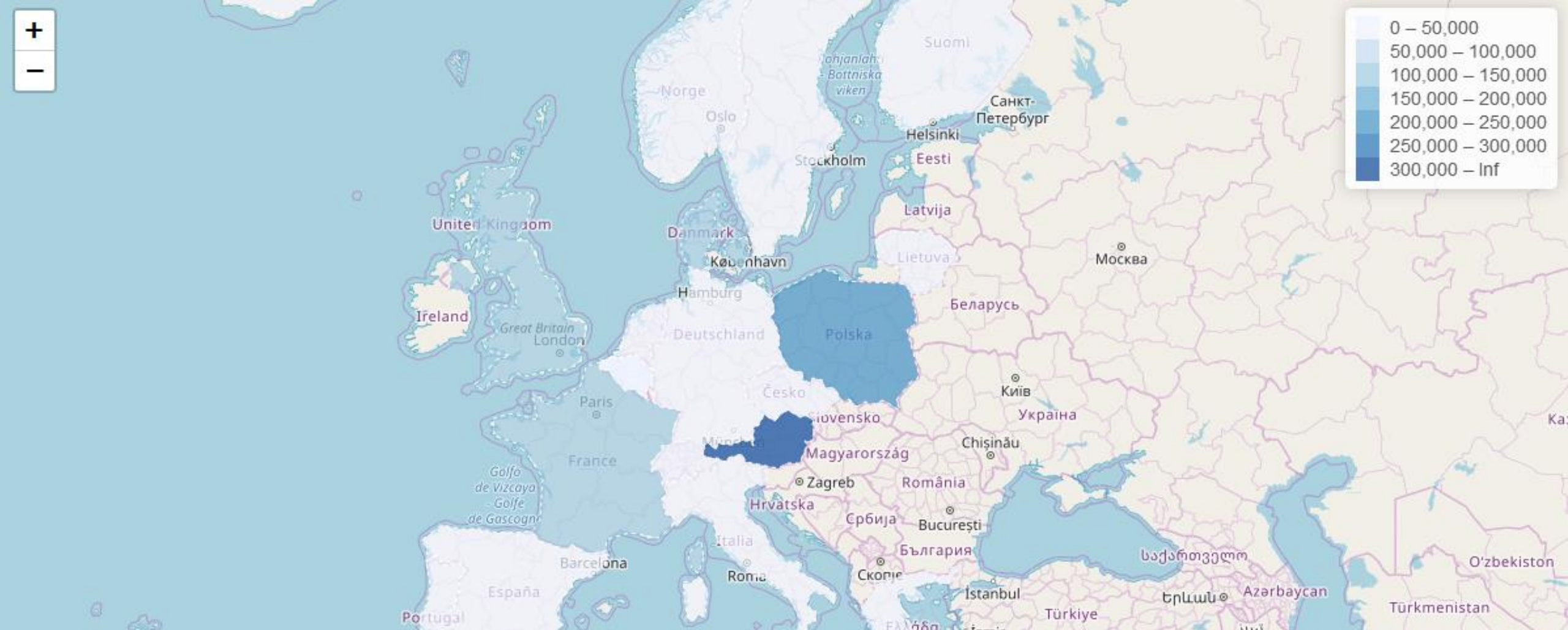
# Which are most profitable items?

- Nexus mostly sells „white hanging heart t-light holder”, „regency cakestand 3 tier” and „jumbo bag red retrospot”. All those items were sold more than 2000 times in the last year.



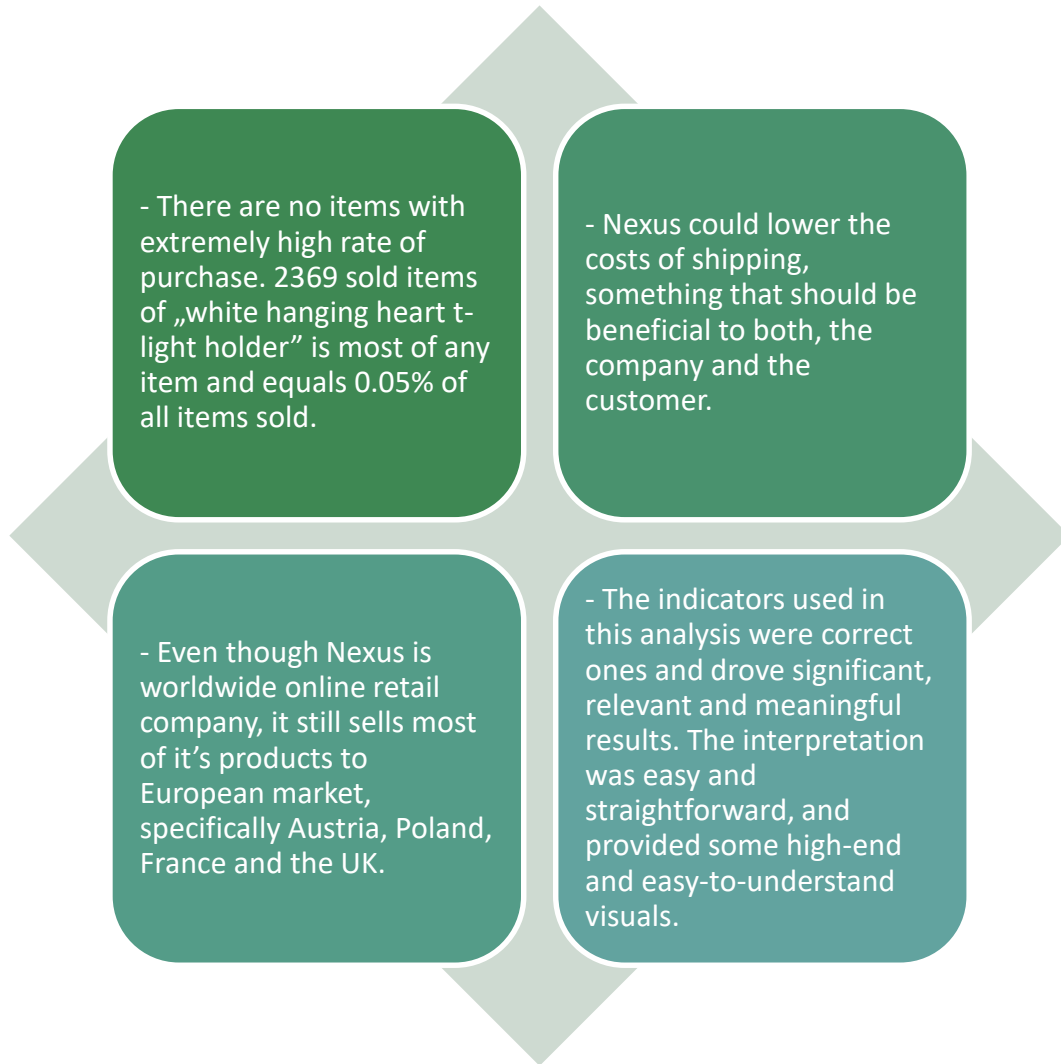
- Nexus gains most profit from indirect costs, rather than items itself. Most money is earned on „Amazon fee”, „Manual” and „Dotcom postage”. This is valuable information that can further be used for business purposes.





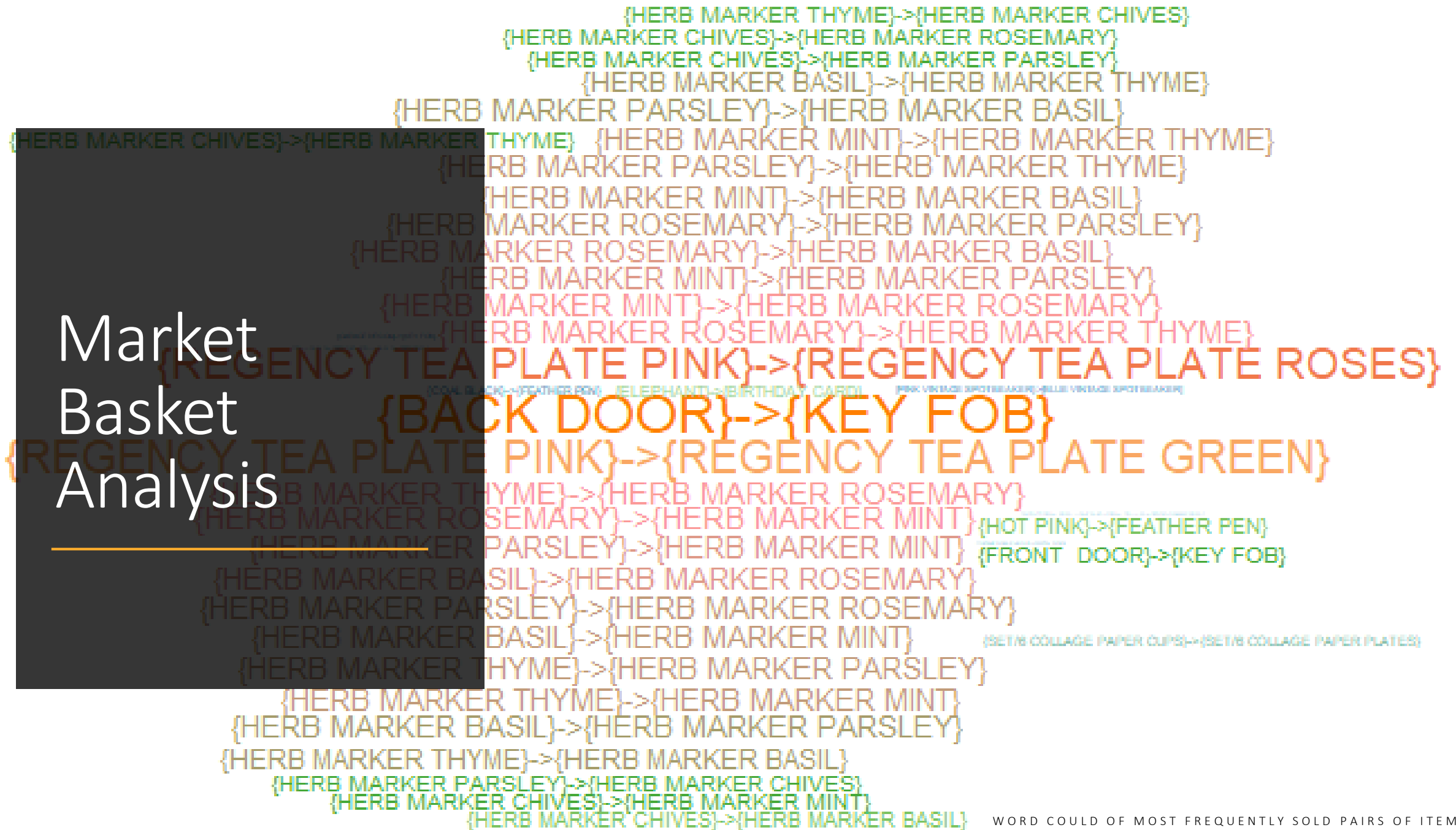
# Where do our customers come from?

WESTERN EUROPE (AUSTRIA, POLAND, FRANCE AND THE UK)



# EDA Conclusions

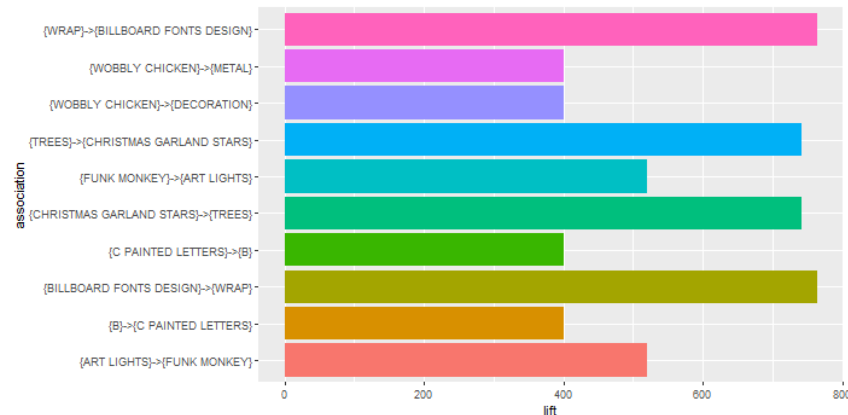
# Market Basket Analysis



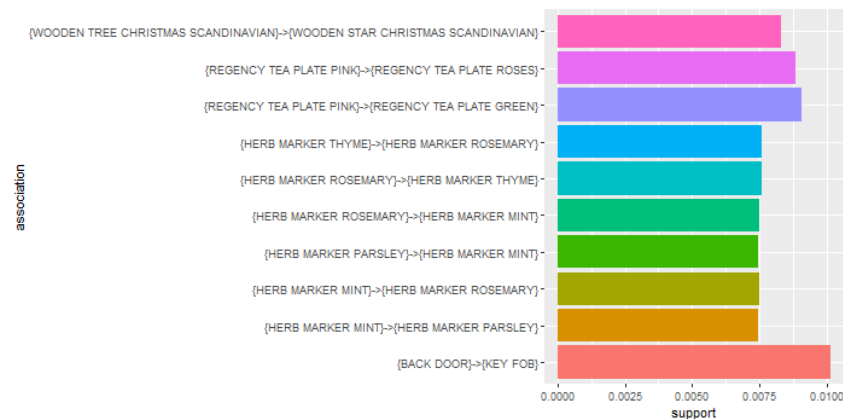
# Which items are most frequently bought together?

- We can see that most frequently our customers buy back door with key fob with support of 0.01. It is closely followed by regency tea plate pink and regency tea plate green.

- The highest lift is the one of wrap and billboard fonts design; and trees and Christmas garland stars. This means that this combination of items most frequently occurs together, rather than alone in the basket.



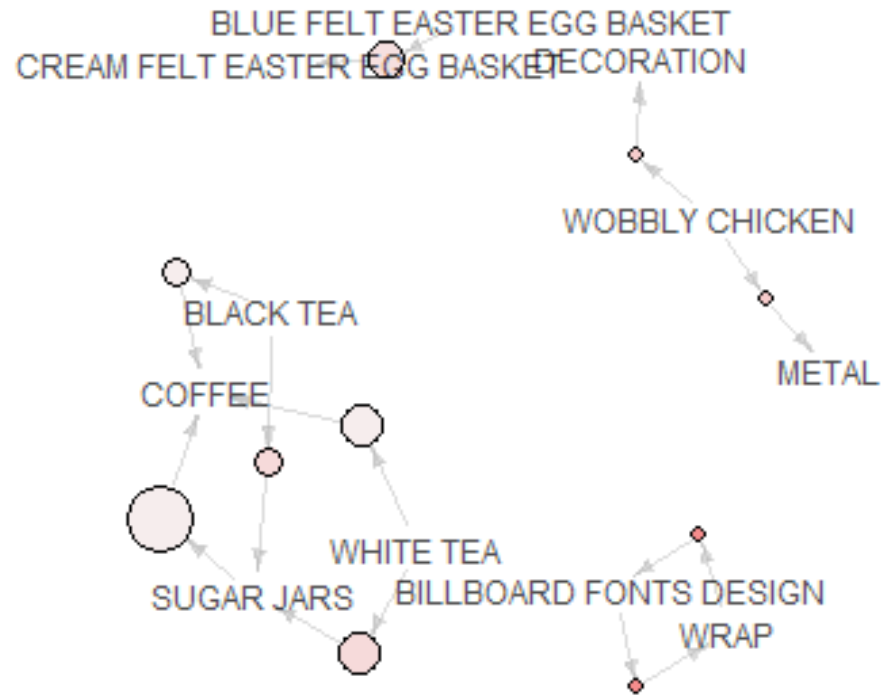
Lift is the ratio of the support of x occurring together with y divided by the probability that x and y occur if they are independent.



Support is the proportion of the transactions in the data that contain an itemset of interest.

### Graph for 10 rules

size: support (0.001 - 0.004)  
color: lift (53.495 - 763.969)



# Connections between most frequently sold items

# MBA Conclusions

---

- There are 4678 association rules in the data. This means that 4678 items follow specific pattern in how they are paired in customer's basket.
- Several pairs of association rules can be used to improve our selling strategy
- All the indicators used are great to develop the aforementioned strategies. No additional data is needed for this kind of analysis and our analysis was successful.



# Recommendations

---



1. Create special offers of items frequently bought together (e.g. trees and Christmas garland stars and back door with key fob) which would be attractive to customers.



2. Use yearly data that showed higher sales during holidays to adjust marketing strategies. By that we mean accessing customers with special offers, giveaways and seasonal items.



3. Improve sales in big market countries. Big markets such as Spain, Germany and Italy hold big potential and company must adjust marketing strategies to attract more customers from this area. Also we recommend to spread customer base on Eastern Europe. More data and analyses are to better understand socio-demographic segmentation of customers.



# Value created and Conclusions

---

The data and analyses were **successful** and we provided **valuable** and **meaningful** recommendations to Nexus management.

If Nexus implements our recommendations, sales are expected to **grow** about **10%** with ROI over **100%**.

Further work will be dedicated to overall marketing plan for Nexus based on our finding, along with market testing.

