"Loyalty Turns Customers into Relationships"

Fordham University Gabelli School of Business
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Meet the Team

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Our presentation has seven sections:

1. Loyalty Customer Segments
2. Cluster and RFM Analysis
3. EU-to-US Cluster Model
4. Seasonality and Loyalty Analysis
5. Predictive Analytics
6. Dashboard for Management Metrics
7.   Recommendations

An Appendix is included at the end

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Main Topics to Address

1. How to segment the VELUX customers and who are the most active?

2. Are there any similarities or differences between European and US markets?

3. Are there any implications for the future of the reward program based on the performance in the past? Potential US partners?

Summary of the Data Files we were given:

- 3 SQL Data files for the UK rewards program, Netherlands rewards program, and global data for the whole rewards program
- We converted these files into CSV files: 337 files in total with some files with over 50,000 rows of data
- We narrowed this down to 13 CSV files, which we were able to analyze in Excel, SPSS, and Tableau
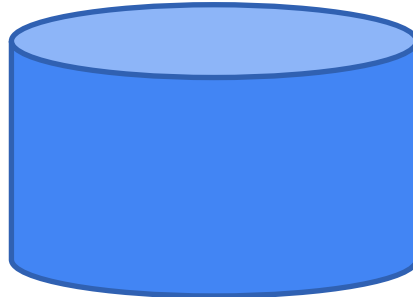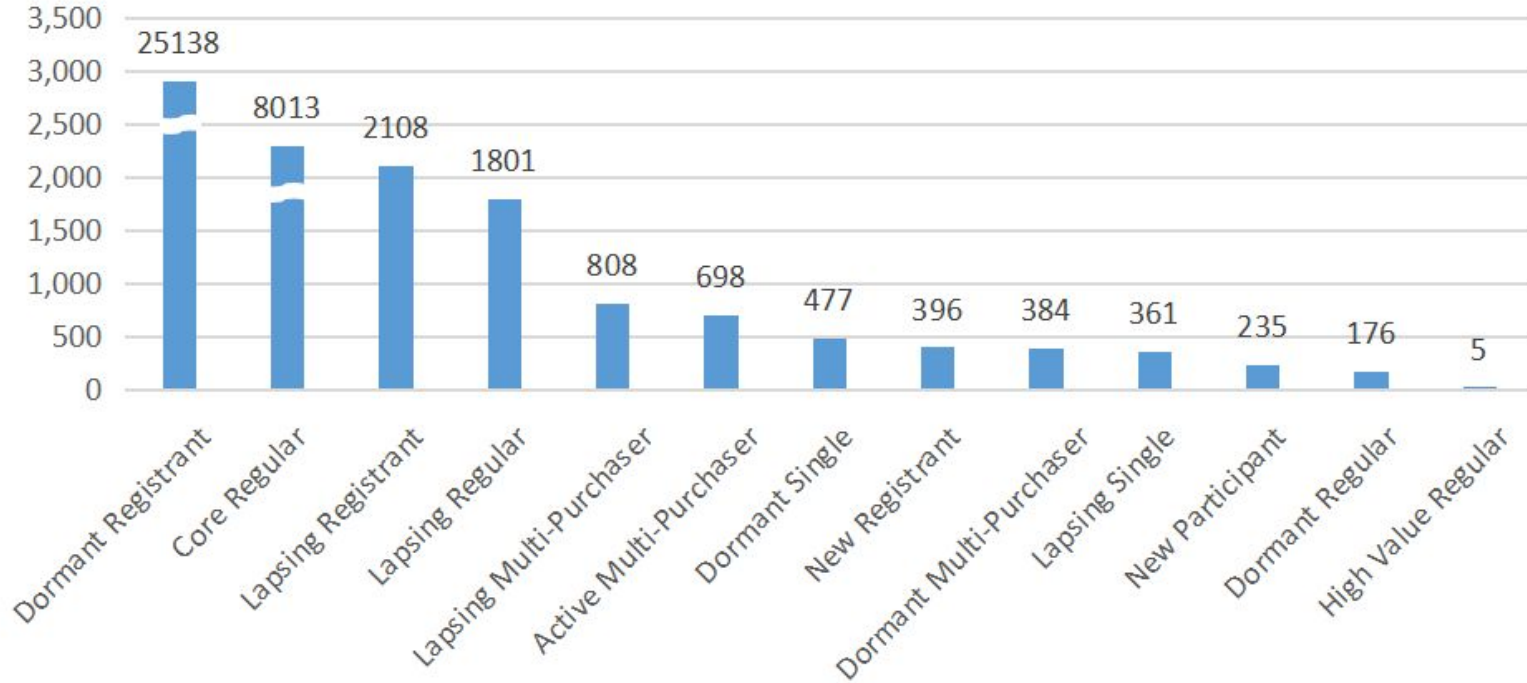
1.
Loyalty Customer Segments

What are the most active/loyal segments?

Segment Count

Purchase Level
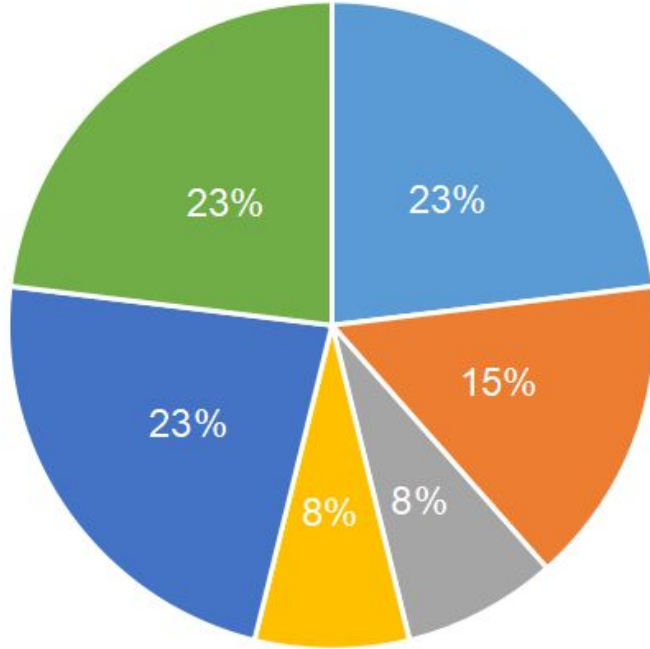
Pie chart segments:
- 2-4 purchases — 23%
- 5+ purchases — 15%
- 5+ purchases Mix < 5 — 8%
- 5+ purchases Mix >= 5 — 8%
- No purchases — 23%
- Single purchase — 23%

Most customers made 4 purchases or less

What is significant about the main segments?

- Most of the existing customers are dormant registrant
- Nearly 75% of the customers purchased less than times
- Key accounts - customers with great potential
- Less frequent customers - who to push for loyalty

2.
Cluster and RFM Analysis

Overall Plan

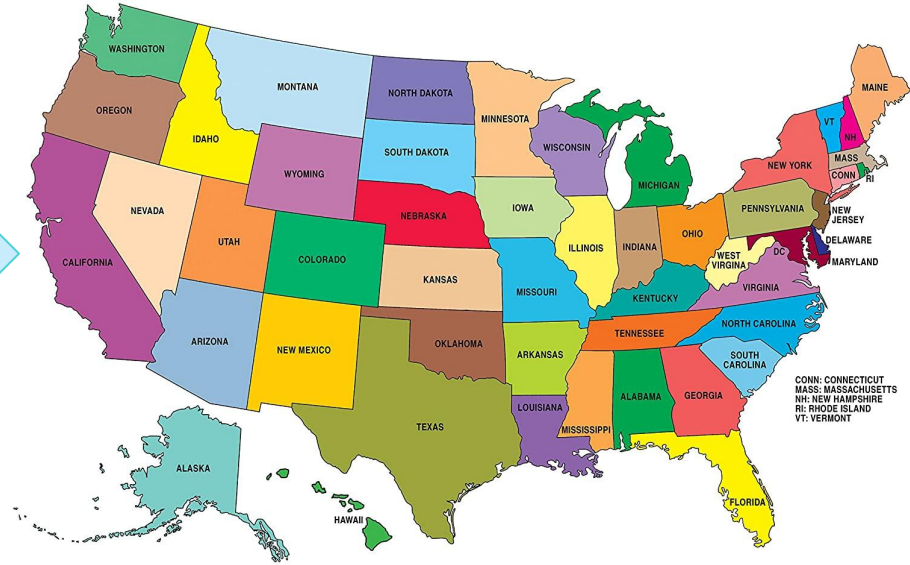| Project Goal | Make prediction of loyalty program performance in the USA using European Data |

K-means Clustering

Regression Model

EU Region

Shared Regression Model

US Region

K-means Clustering Working Process

Collect EU,US Housing & Demographic datasets

K-means Clustering

Match EU Clusters with US Clusters

-Median housing price
-Median household Income
-Home ownership rate
-Median Property Tax
-Population Density
-Median Age
-Urban Population
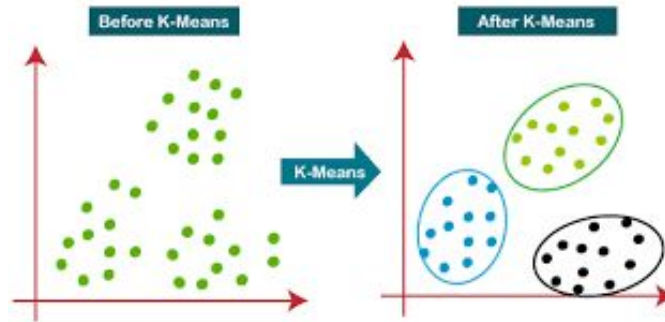
Before K-Means

After K-Means

K-Means

EU   US

Cluster DK-FR-UK ------> Cluster A

Cluster IE-AT ------> Cluster B

Cluster BE-NL ------> Cluster C

Cluster DE IT ------> Cluster D

Regression Model Working Process

Data Cleaning & Aggregation -tblCustomer

Dependent/Independent Variables choosing based on RFM Model

Run GLM Regressions on the Variables from each EU clusters

tblCustomer.csv

RFM

Recency

lastSubmissionDate

-membershipDate

Frequency

NumberOfSubmssions

Monetary value

Customerwindows

K-means Clustering of EU Countries

DK-FR-UK
IE-AT
BE-NL
DE-IT

Denmark
Netherlands
Austria
Germany
United Kingdom
France
Belgium
Ireland
Italy

Median_Household_Income
Median_Housing_Price_index

Household Income

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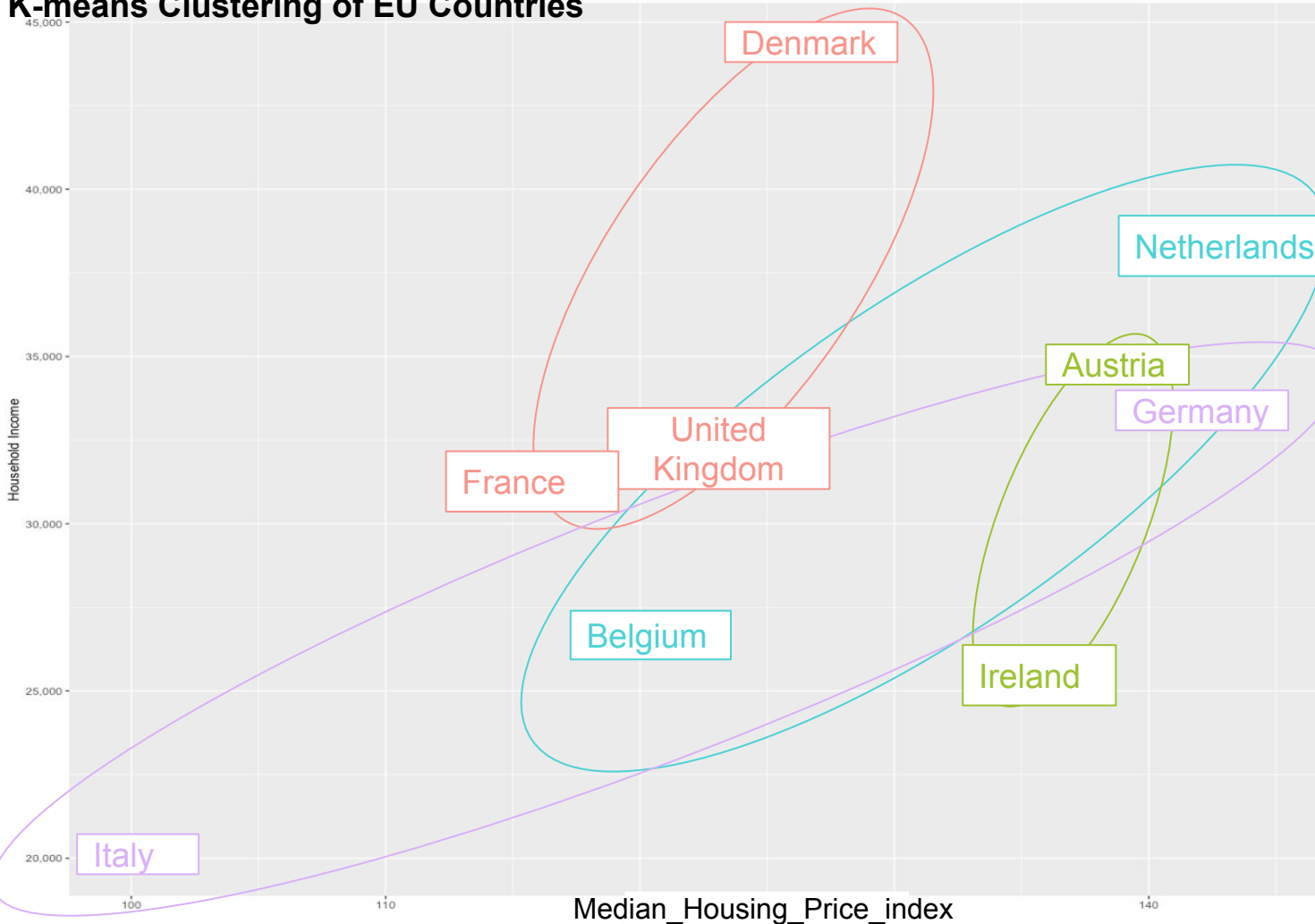
K-mean Clustering of USA States
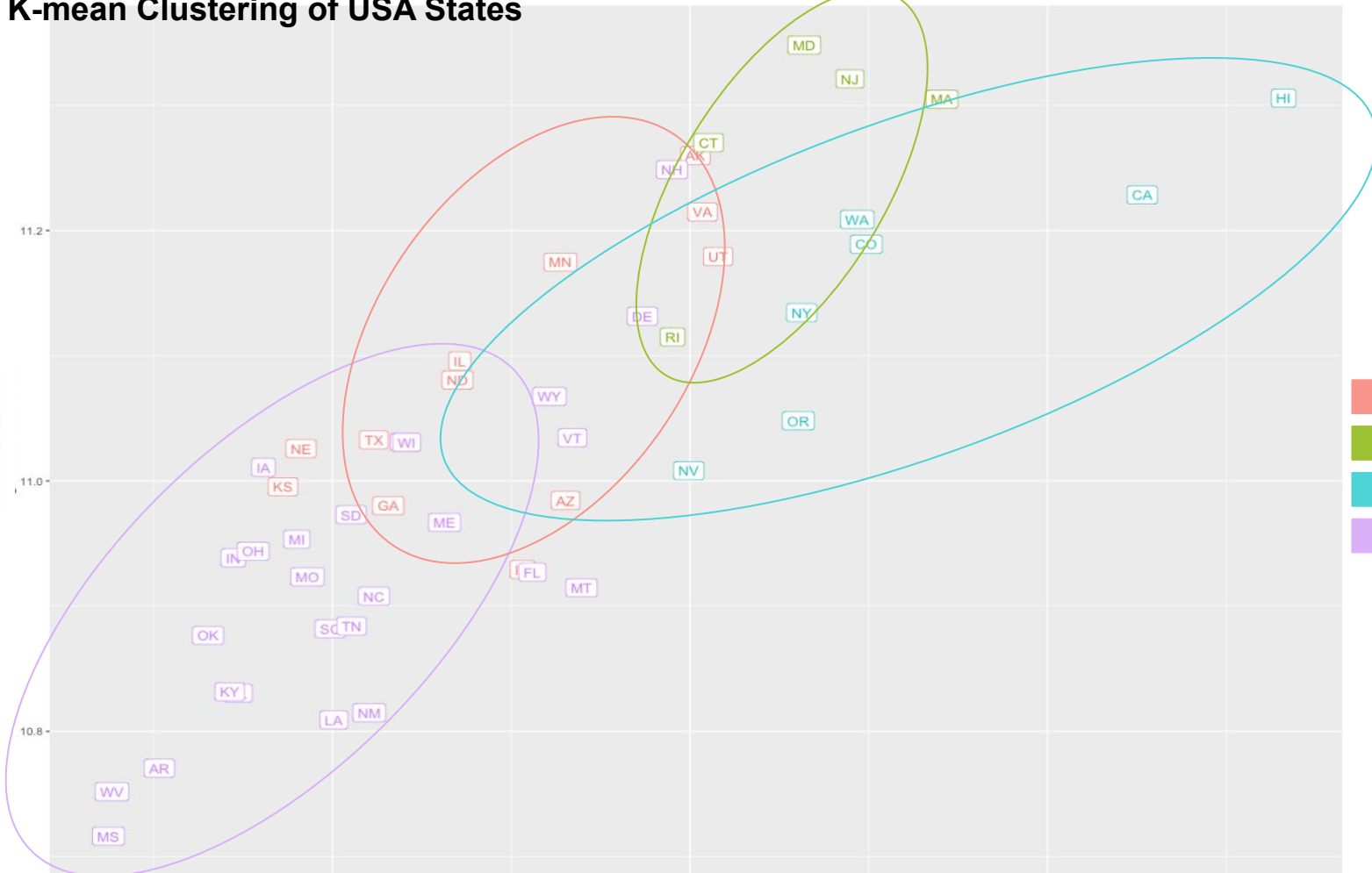
3.
EU-to-US Cluster Models

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4 Significant Region Matches

EU	US
Cluster DK-FR-UK ------> Cluster A	
Cluster IE-AT ------> Cluster B	
Cluster BE-NL ------> Cluster C	
Cluster DE IT ------> Cluster D	

List of European clusters:

1. United Kingdom, France, Denmark
2. Austria and Ireland
3. Belgium and Netherlands
4. Germany and Italy

List of American clusters:

A. Alaska, Minnesota, Virginia, Utah, Illinois, North Dakota, Nebraska, Arizona, Kansas, Georgia, Idaho, Texas
B. Maryland, New Jersey, Connecticut, Massachusetts, Rhode Island
C. New York, California, Nevada, Washington, Colorado, Oregon, Hawaii
D. Pennsylvania, Arkansas, West Virginia, Mississippi, New Hampshire, Delaware, Wyoming, Montana, Oklahoma, North Carolina, South Carolina, Montana, Indiana, Vermont, Missouri, Michigan, Maine, Iowa, New Mexico, Louisiana, Florida, Kentucky, Tennessee, South Dakota, Ohio, Wisconsin

RFM Analysis

Independent Variables

Gamma Generalized Linear Model (GLM)

Dependent Variable → **PointSpent**

Recency → *lastSubmissionDate* *-membershipDate*

Frequency → *NumberOfSubmssions*

Monetary value → *Customerwindows*

Customer Segments → *segment*

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EU Cluster 1

Denmark

United Kingdom

France

US Cluster 2

MA
CT
NJ RI
MD

Model 1

Variable Name	Slope Parameter	P-value	Significance
(Intercept)	5.52E+00	< 2e-16	***
segmentCore Regular	-2.52E-01	2.89E-01	
segmentDormant Multi-Purchaser	-1.00E+00	2.03E-03	**
segmentDormant Registrant	1.31E+00	7.02E-07	***
segmentDormant Regular	-5.26E-01	1.52E-01	
segmentDormant Single	-1.48E+00	1.46E-04	***
segmentLapsing Multi-Purchaser	2.25E-01	4.70E-01	
segmentLapsing Registrant	7.39E-01	6.61E-01	
segmentLapsing Regular	4.18E-01	9.29E-02	
segmentLapsing Single	-4.42E-01	4.08E-01	
segmentNew Participant	-2.14E+00	1.33E-02	*
customerWindows	8.78E-05	4.60E-01	
numberOfSubmissions	1.53E-02	< 2e-16	***
Recency	1.65E-03	< 2e-16	***

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EU Cluster 2

Ireland
Austria

US Cluster 3

WA
OR
NV
CA
CO
NY
HI

Model 2

Variable Name	Slope Parameter	P-value	Significance
(Intercept)	5.2904963	< 2e-16	***
segmentCore Regular	0.7375051	0.06463	
segmentDormant Registrant	1.1193454	0.01235	*
segmentDormant Regular	0.8660828	0.27101	
segmentLapsing Multi-Purchaser	-0.0663918	0.89468	
segmentLapsing Regular	0.7770395	0.05548	
segmentLapsing Single	-1.9464567	0.00451	**
customerWindows	0.0003962	9.22E-05	***
numberOfSubmissions	0.0045705	8.31E-06	***
Recency	0.0008938	0.00091	***

EU Cluster 3

Netherlands
Belgium

US Cluster 1
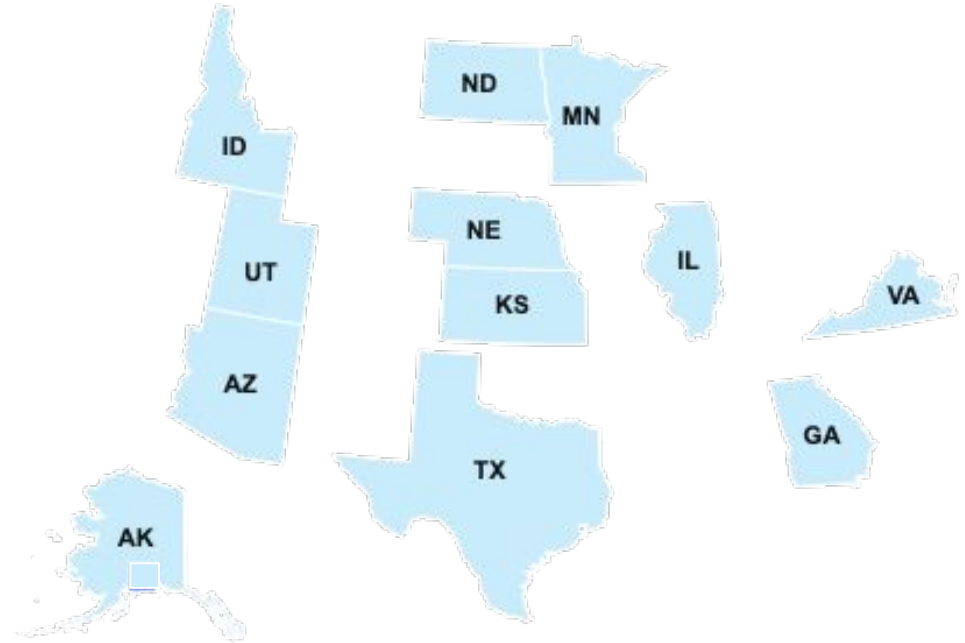
Model for Cluster 3

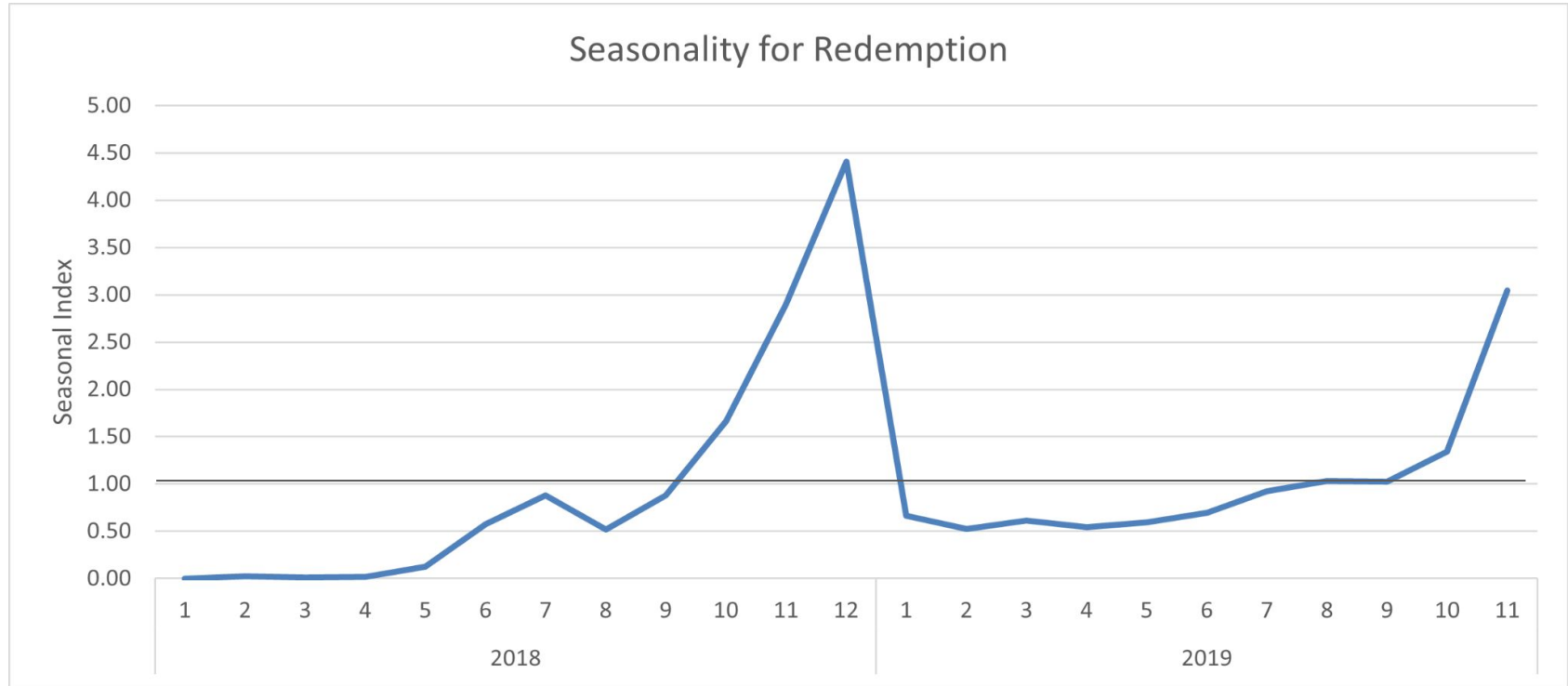| Variable Name	Slope Parameter	P-value	Significance
(Intercept)	4.517964	< 2e-16	***
segmentCore Regular	0.4990236	0.2099	
segmentDormant Registrant	0.8228453	0.0388	*
segmentDormant Regular	0.8136095	0.3017	
segmentLapsing Multi-Purchaser	-0.7328909	0.0936	
segmentLapsing Regular	0.5406218	0.1739	
segmentLapsing Single	-0.5461047	0.3822	
customerWindows	0.0032292	< 2e-16	***
numberOfSubmissions	0.0052054	3.37E-08	***
Recency	0.000844	8.68E-13	***

EU Cluster 4

US Cluster 4
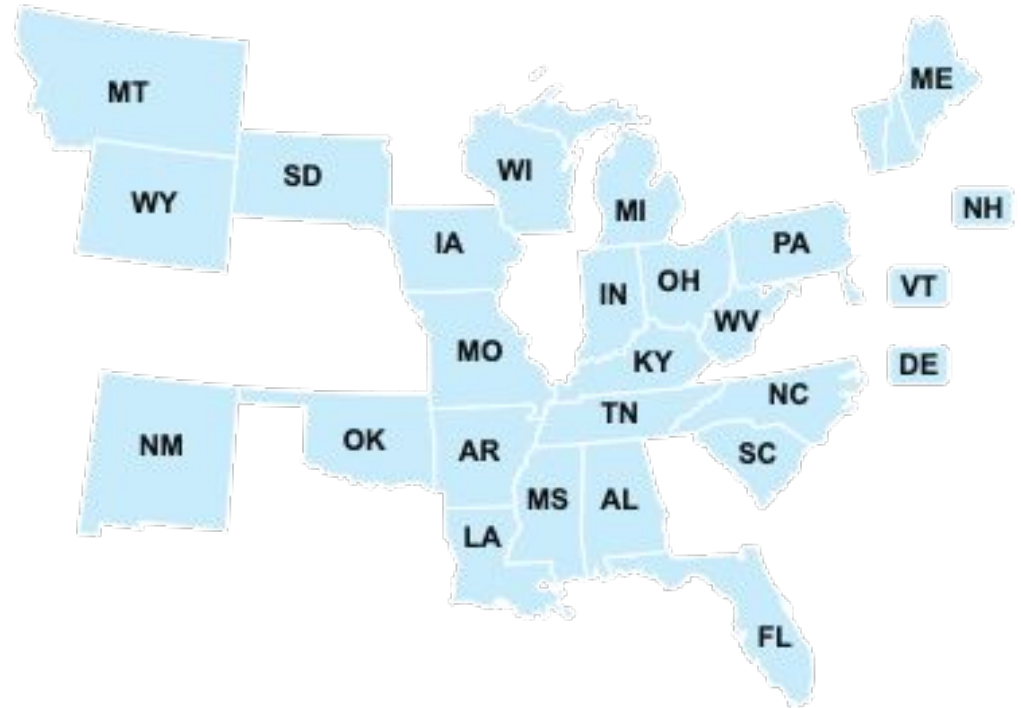
Model for Cluster 4

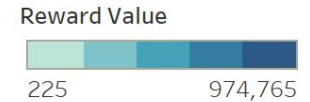| Variable Name	Slope Parameter	P-value	Significance
(Intercept)	4.76E+00	< 2e-16	***
segmentCore Regular	7.75E-01	< 2e-16	***
segmentDormant Multi-Purchaser	-5.01E-03	0.9341	
segmentDormant Registrant	-8.68E-02	0.21475	
segmentDormant Regular	5.27E-01	1.93E-12	***
segmentDormant Single	-4.54E-01	1.24E-11	***
segmentHigh Value Regular	6.73E-01	0.00647	**
segmentLapsing Multi-Purchaser	4.80E-02	0.23083	
segmentLapsing Registrant	1.50E-01	0.4707	
segmentLapsing Regular	6.43E-01	< 2e-16	***
segmentLapsing Single	-4.75E-01	3.08E-15	***
segmentNew Participant	-4.01E-01	4.01E-09	***
segmentNew Registrant	-1.42E-01	0.42074	
customerWindows	1.05E-02	< 2e-16	***
numberOfSubmissions	-3.14E-03	2.68E-09	***
Recency	3.76E-04	5.76E-09	***

4. Seasonality and Loyalty Analysis

Not surprising: points redemption is seasonal

Five partners = 80% of the Points

Media Markt 974,765	Zalando 605,915	Intersport 210,000	Decathlon 206,345	fnac 183,355
	Magasin 541,400	bol.com 153,840	Media Markt Belgique 142,300	IKEA 122,500
Elgiganten 925,500	Amazon 495,370	Ticketmaster 100,500	VELUX Credit Note 77,316	
		Douglas 100,460	Media Market	
		REWE 78,600		

Reward Value

225   974,765
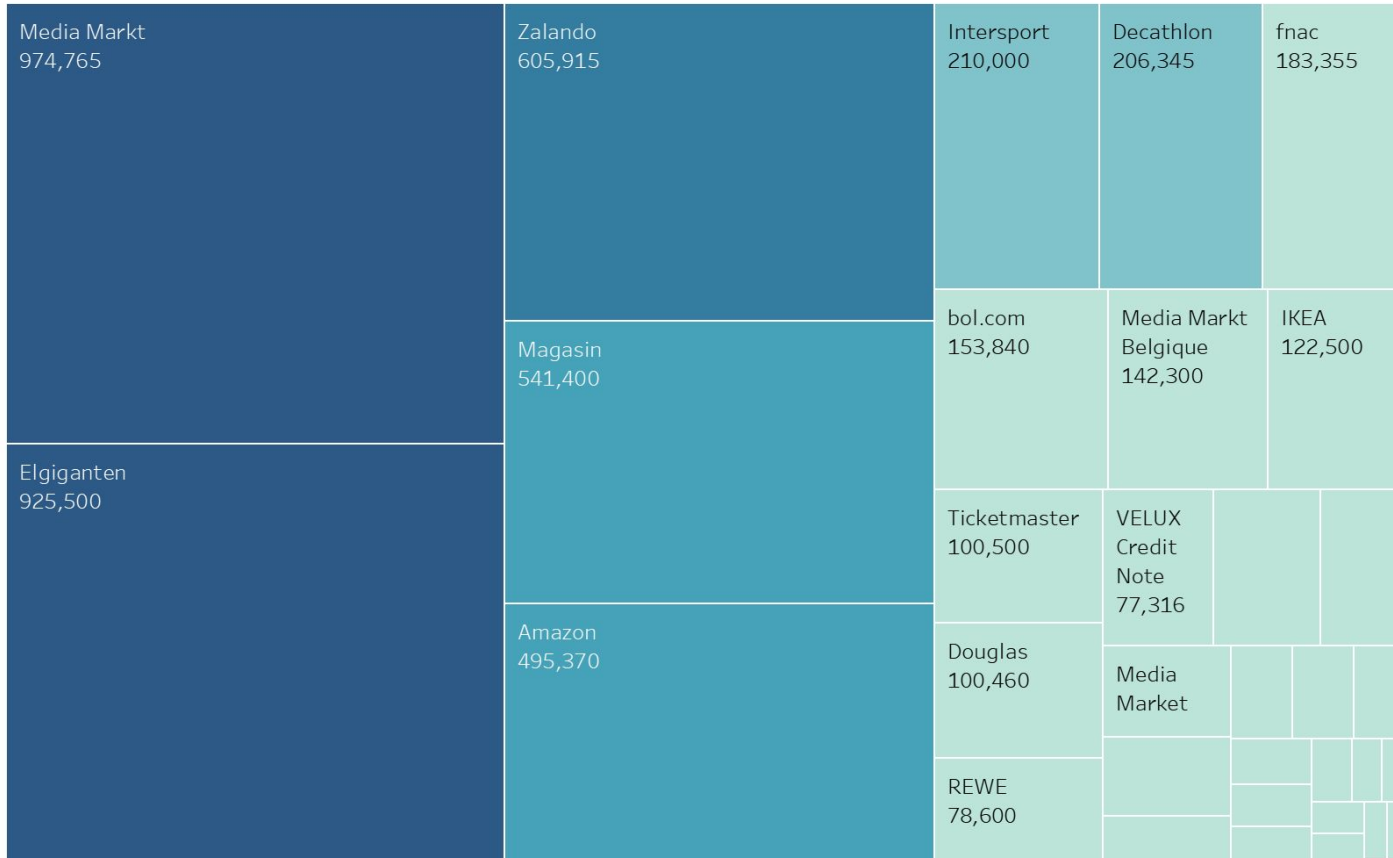
Rewards Redeem Pattern Vary by Country

Denmark

Partner — Reward Value

- Elgiganten
- Magasin
- Intersport
- Zalando
- IKEA
- Ticketmaster
- VELUX Credit Note

0K, 100K, 200K, 300K, 400K, 500K, 600K, 700K, 800K, 900K

Germany

Partner — Reward Value

- Media Markt
- Zalando
- Douglas
- REWE
- Eventim
- VELUX Concierge
- Thomas Cook
- Weg.de
- VELUX Catalogue

0K, 100K, 200K, 300K, 400K, 500K, 600K, 700K, 900K

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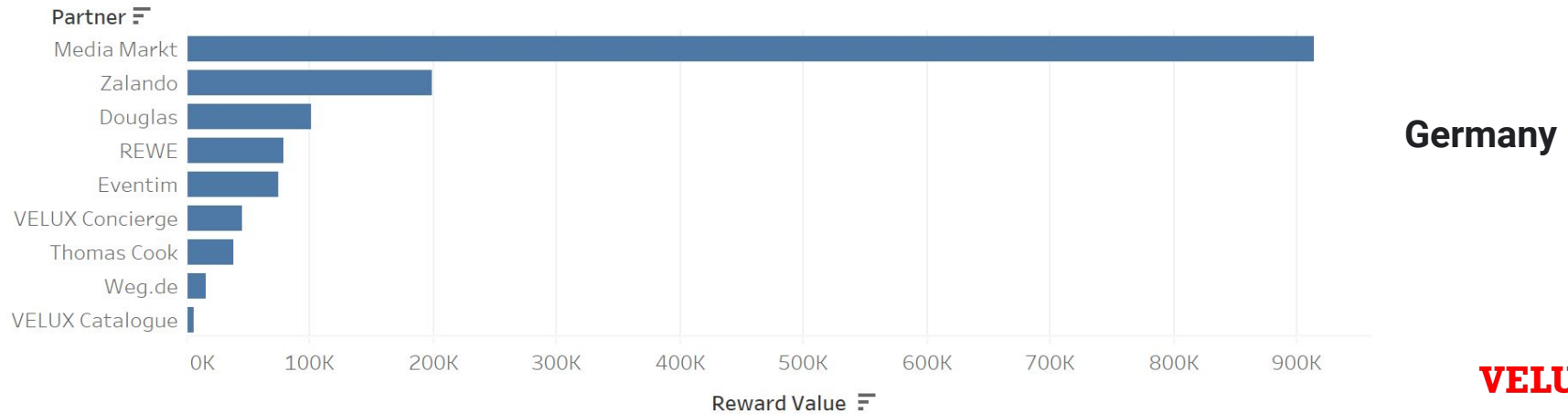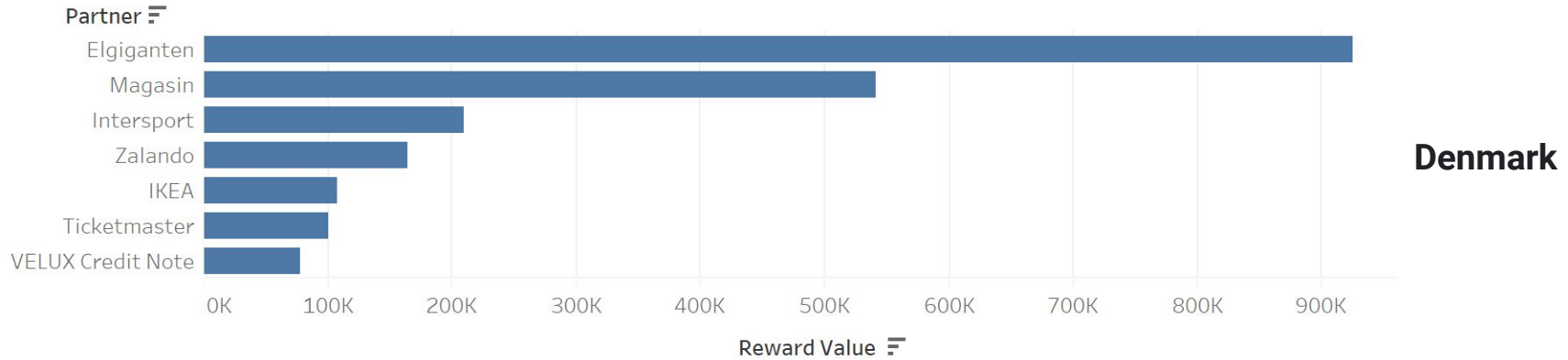
Results:
- 5 partners with high reward value
- 80/20 rule applies to partners
- Preference of each country is slightly different

Implications:
- Expand relationship with the high-value partners
- Find partners with similar potential

Rewards Forms

rewardType		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		93	0.2	0.2	0.2
	0	2	0	0	0.2
	Amilon eGift	43459	92	92	92.2
	Assistance Chantier	25	0.1	0.1	92.3
	Cashback Reward	8	0	0	92.3
	Catalogue	1379	2.9	2.9	95.2
	Concierge Reward	87	0.2	0.2	95.4
	Digital Code	43	0.1	0.1	95.5
	Gift Card	2114	4.5	4.5	100
	VELUX Credit Note	6	0	0	100
	Total	47216	100	100	

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Rewards forms are concentrated, too

- The majority of the rewards are offered in the form of Amilon eGift
- Consumers preferences for rewards should be tracked
- Reward types can be diversified

5.
Dashboard for Management Metrics

Tableau Data Analysis Steps

Loyalty program sign-ups and points → SQL Database → Selected Marketing Metrics → Tableau → Descriptive Analysis dashboard

Metrics your marketing manager needs to know
- Current members, by segment and country
- Active members, by segment and country
- New members, where growth is happening
- Redemptions; segments in areas of key activity
- Loyalty members and participation vs seasonal goals

6.
Predictive Analytics

Reward Forecasts for 2022
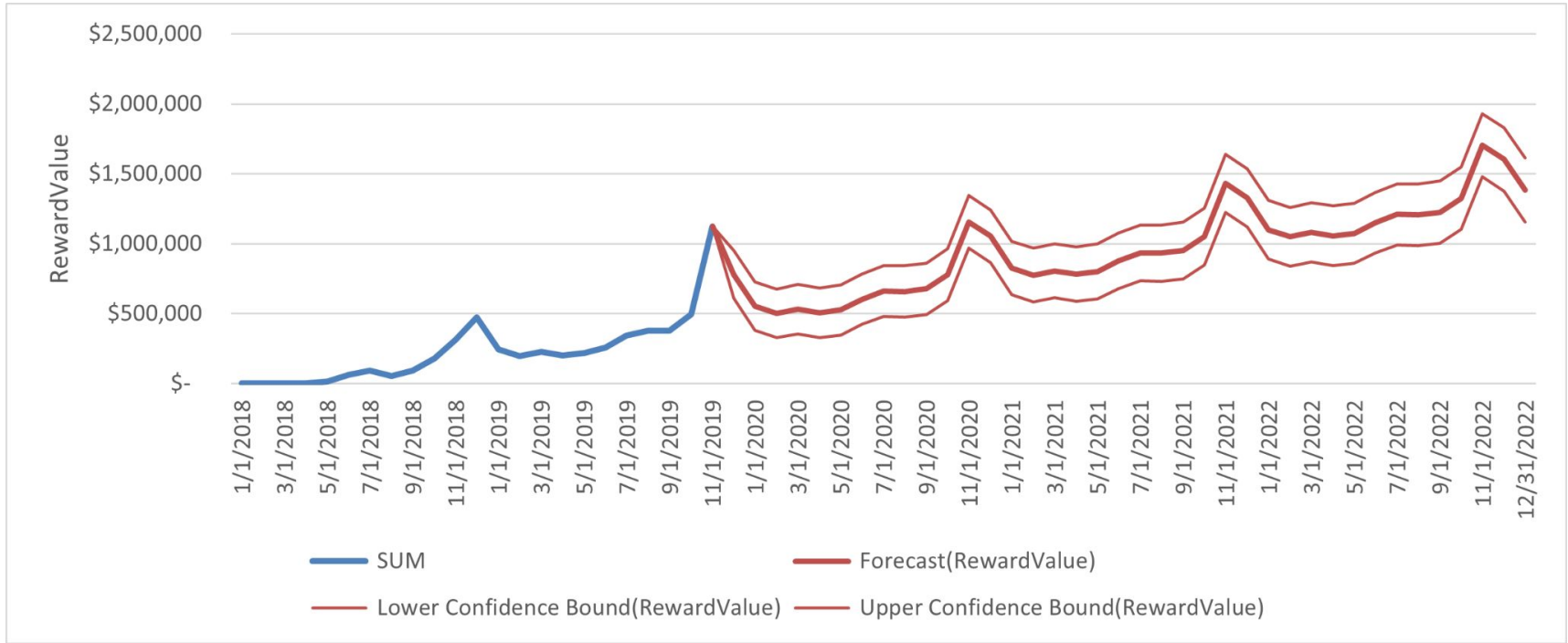
Estimated EU Monthly Redemption Values for 2022

Month	Lower Confidence Bound (RewardValue)
1/1/2022	$ 1,309,343
2/1/2022	$ 1,260,250
3/1/2022	$ 1,292,891
4/1/2022	$ 1,269,472
5/1/2022	$ 1,290,093
6/1/2022	$ 1,368,298
7/1/2022	$ 1,428,253
8/1/2022	$ 1,428,372
9/1/2022	$ 1,447,532
10/1/2022	$ 1,549,312
11/1/2022	$ 1,930,815
12/1/2022	$ 1,830,095
12/31/2022	$ 1,610,927

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7.
Recommendations

When to Campaign

- Popular times of the year for purchases (Quarters 1 and 3)
- Popular redemption months
  - High redemption in **November** and **December** each year
- Who to partner with
  - Keep relationship with **Auszahlung**, **IKEA**, and **VELUX Credit Note**
  - Cultivate partners with high potential reward value
  - Value in **Electronics** and **Sports Apparel**
  - American brands: **Best Buy, Staples, Dick's**
- What to offer
  - Track consumers' preferences for **Amilon eGift**
  - **Diversify** reward types

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Here is What We Leave You…

Marketing Area	Recommendations
1. Loyalty Program Segments	Build most valuable customer types Motivate less frequent members
2. European – US Marketing Model	Target selected state clusters
3. Partner Development	Expand electronics sector to US
4. Forecasts for 2022	Set goals and monitor real-time metrics with the dashboard
5. Measure and Monitor Progress in EU	Dashboard with real-time metrics

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Thank You!

8.
Appendix

European and American Clusters Matched

List of European clusters:

1. United Kingdom, France, Denmark
2. Austria and Ireland
3. Belgium and Netherlands
4. Germany and Italy

List of American clusters:

1. Connecticut, Maryland, Massachusetts, New Jersey, Rhode Island
2. California, Colorado, Hawaii, Nevada, New York, Oregon, Washington
3. Alaska, Arizona, Georgia, Idaho, Illinois, Kansas, Minnesota, Nebraska, North Dakota, Texas, Utah, Virginia
4. Arkansas, Delaware, Florida, Indiana, Iowa, Kentucky, Louisiana, Maine, Michigan, Mississippi, Missouri, Montana, New Hampshire, New Mexico, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, West Virginia, Wisconsin, Wyoming

Cluster Significance Tables

```
Call:
glm(formula = pointsSpent ~ segment + customerWindows + numberOfSubmissions +
    Recency, family = Gamma(link = "log"), data = customer_df_cleaned %>%
    filter(residency %in% c("DK", "UK", "FR")))

Deviance Residuals:
    Min      1Q   Median      3Q      Max
-4.6199  -1.2732  -0.6948   0.0538   5.3217

Coefficients:
                                  Estimate Std. Error t value Pr(>|t|)
(Intercept)                      5.268e+00  1.550e-01  33.994  < 2e-16 ***
segmentActive Multi-Purchaser    2.518e-01  2.372e-01   1.062 0.288517
segmentDormant Multi-Purchaser  -7.499e-01  2.336e-01  -3.210 0.001346 **
segmentDormant Registrant        1.561e+00  1.376e-01  11.350  < 2e-16 ***
segmentDormant Regular          -2.746e-01  2.893e-01  -0.949 0.343647
segmentDormant Single           -1.226e+00  3.167e-01  -3.871 0.000112 ***
segmentLapsing Multi-Purchaser   4.770e-01  2.167e-01   2.201 0.027849 *
segmentLapsing Registrant        9.910e-01  1.669e+00   0.594 0.552713
segmentLapsing Regular           6.693e-01  1.051e-01   6.370 2.28e-10 ***
segmentLapsing Single           -1.900e-01  4.852e-01  -0.392 0.695400
segmentNew Participant          -1.885e+00  8.330e-01  -2.263 0.023732 *
customerWindows                  8.779e-05  1.189e-04   0.738 0.460390
numberOfSubmissions              1.530e-02  1.134e-03  13.487  < 2e-16 ***
Recency                          1.653e-03  1.651e-04  10.008  < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Gamma family taken to be 2.761788)

    Null deviance: 4997.2  on 2257  degrees of freedom
Residual deviance: 3556.7  on 2244  degrees of freedom
AIC: 37217

Number of Fisher Scoring iterations: 14
```

EU Cluster 1

```
Call:
glm(formula = pointsSpent ~ segment + customerWindows + numberOfSubmissions +
    Recency, family = Gamma(link = "log"), data = customer_df_cleaned %>%
    filter(residency %in% c("AT", "IE")))

Deviance Residuals:
    Min      1Q   Median      3Q      Max
-2.9846  -0.7793  -0.2486   0.2628   3.0580

Coefficients:
                                  Estimate Std. Error t value Pr(>|t|)
(Intercept)                      6.0280014  0.2705502  22.281  < 2e-16 ***
segmentActive Multi-Purchaser   -0.7375051  0.3982894  -1.852 0.06463 .
segmentDormant Registrant        0.3818404  0.2402927   1.589 0.11264
segmentDormant Regular           0.1285777  0.6840815   0.188 0.85098
segmentLapsing Multi-Purchaser  -0.8038968  0.3243525  -2.478 0.01350 *
segmentLapsing Regular           0.0395344  0.1214613   0.325 0.74494
segmentLapsing Single           -2.6839618  0.5649177  -4.751 2.61e-06 ***
customerWindows                  0.0003962  0.0001005   3.940 9.22e-05 ***
numberOfSubmissions              0.0045705  0.0010154   4.501 8.31e-06 ***
Recency                          0.0008938  0.0002680   3.336 0.00091 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Gamma family taken to be 0.9232228)

    Null deviance: 791.71  on 541  degrees of freedom
Residual deviance: 448.33  on 532  degrees of freedom
AIC: 8828

Number of Fisher Scoring iterations: 22
```

EU Cluster 2

```
Call:
glm(formula = pointsSpent ~ segment + customerWindows + numberOfSubmissions +
    Recency, family = Gamma(link = "log"), data = customer_df_cleaned %>%
    filter(residency %in% c("BE", "NL")))

Deviance Residuals:
    Min      1Q   Median      3Q      Max
-4.2087  -0.5763  -0.1124   0.2970   2.9739

Coefficients:
                                  Estimate Std. Error t value Pr(>|t|)
(Intercept)                      5.0169876  0.1206051  41.598  < 2e-16 ***
segmentActive Multi-Purchaser   -0.4990236  0.3977807  -1.255 0.209943
segmentDormant Registrant        0.3238217  0.0979145   3.307 0.000975 ***
segmentDormant Regular           0.3145860  0.6854266   0.459 0.646359
segmentLapsing Multi-Purchaser  -1.2319145  0.1961100  -6.282 4.96e-10 ***
segmentLapsing Regular           0.0415982  0.0569841   0.730 0.465561
segmentLapsing Single           -1.0451282  0.4932565  -2.119 0.034347 *
customerWindows                  0.0032292  0.0002123  15.213  < 2e-16 ***
numberOfSubmissions              0.0052054  0.0009355   5.564 3.37e-08 ***
Recency                          0.0008440  0.0001165   7.243 8.68e-13 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Gamma family taken to be 0.4647025)

    Null deviance: 1311.96  on 1022  degrees of freedom
Residual deviance: 528.58  on 1013  degrees of freedom
AIC: 14930

Number of Fisher Scoring iterations: 17
```

EU Cluster 3

```
Call:
glm(formula = pointsSpent ~ segment + customerWindows + numberOfSubmissions +
    Recency, family = Gamma(link = "log"), data = customer_df_cleaned %>%
    filter(residency %in% c("IT", "DE")))

Deviance Residuals:
    Min      1Q   Median      3Q      Max
-5.6050  -0.4164  -0.0248   0.2484   2.9300

Coefficients:
                                  Estimate Std. Error t value Pr(>|t|)
(Intercept)                      5.534e+00  3.089e-02 179.166  < 2e-16 ***
segmentActive Multi-Purchaser   -7.749e-01  2.961e-02 -26.169  < 2e-16 ***
segmentDormant Multi-Purchaser  -7.800e-01  5.631e-02 -13.851  < 2e-16 ***
segmentDormant Registrant       -8.617e-01  6.380e-02 -13.506  < 2e-16 ***
segmentDormant Regular          -2.485e-01  7.111e-02  -3.494 0.000478 ***
segmentDormant Single           -1.229e+00  6.328e-02 -19.417  < 2e-16 ***
segmentHigh Value Regular       -1.025e-01  2.450e-01  -0.418 0.675734
segmentLapsing Multi-Purchaser  -7.270e-01  3.187e-02 -22.811  < 2e-16 ***
segmentLapsing Registrant       -6.246e-01  2.066e-01  -3.023 0.002514 **
segmentLapsing Regular          -1.325e-01  2.237e-02  -5.922 3.34e-09 ***
segmentLapsing Single           -1.250e+00  5.530e-02 -22.597  < 2e-16 ***
segmentNew Participant          -1.176e+00  6.336e-02 -18.560  < 2e-16 ***
segmentNew Registrant           -9.168e-01  1.748e-01  -5.244 1.62e-07 ***
customerWindows                  1.049e-02  1.612e-04  65.094  < 2e-16 ***
numberOfSubmissions             -3.135e-03  5.262e-04  -5.958 2.68e-09 ***
Recency                          3.759e-04  6.447e-05   5.831 5.76e-09 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Gamma family taken to be 0.2984257)

    Null deviance: 7291.8  on 6811  degrees of freedom
Residual deviance: 2511.8  on 6796  degrees of freedom
AIC: 94371

Number of Fisher Scoring iterations: 22
```

EU Cluster 4

Client Research

The target groups are categorized according to the role they play and how they influence VELUX.

- **Primary demand:** End-users, Building owners
- **Commercial demand:** Developers, Installers, Dealers, Specifiers
- **Business environment:** Media, Political influencers, Partners, Employees
- **Major competitors:** Duratex, Saint Gobain North America, Knauf, and CNBN

VELUX has production sites in 11 countries and sales companies in 40 countries

Five partners = 80% of the Points
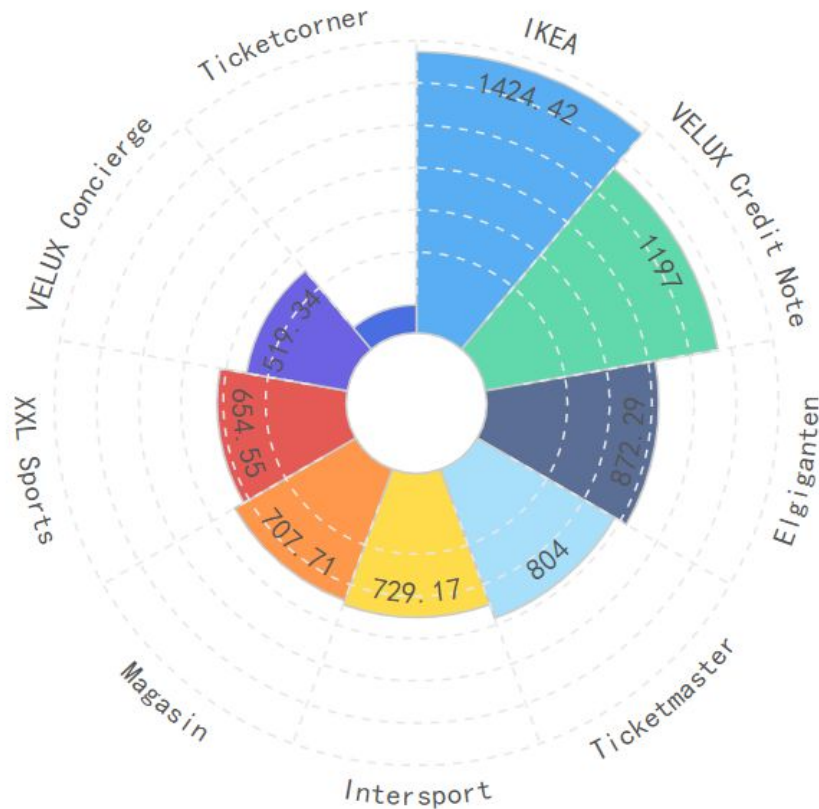
Auszahlung	1865.63
IKEA	1424.42
VELUX Credit Note	1197
Elgiganten	872.29
Ticketmaster	804