

Jeff Team 1 Capstone Project

Members: Pierce Myers, Aaron Leon, Andrew Vernon,
Greg Rehkemper, Ty Mudgistratova



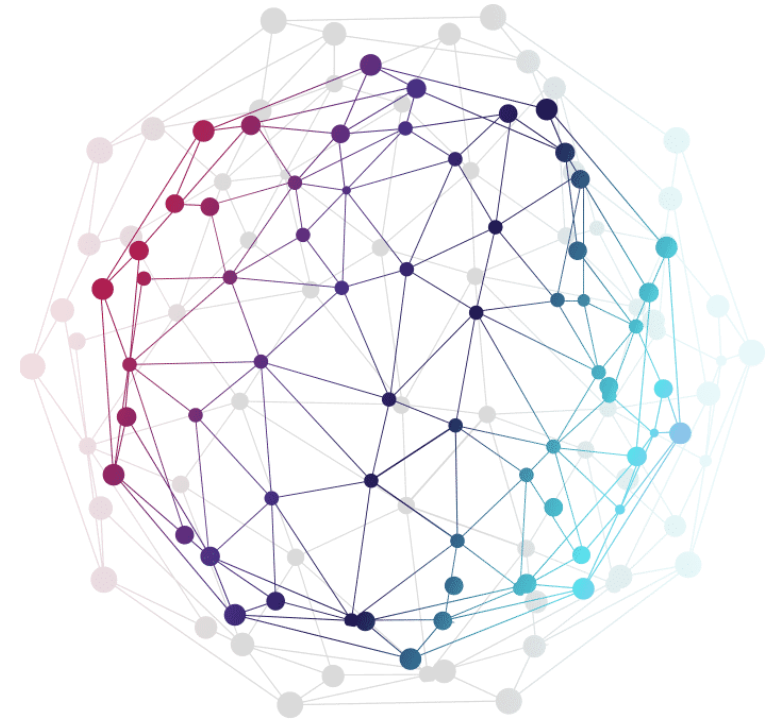
DATA 424



Microsoft

Challenge

- Microsoft's co-sell motion goal is to connect customers with partner solutions that solve customer challenges.
- Such a large ecosystem makes it difficult to establish individual relationships between all partners and customers.
- Prioritize the connecting partners that will be most successful with each of their customers.



Goal

- Aid sellers in a specific territory with partner solutions with the highest rate of success.
- Provide filters that allow a selection of a territory, workload, partner type, solution area.
- Visualizations in the form of charts and graphs represent available solutions, based on categories.

These solutions would enable Jeff's team to simply determine which partners are lacking solutions.



Projected Results

- Display top five solutions that can be filtered by solution area, region, workload, and type of partner.
- Display top five solutions for a specific customer and partner combinations that have had a previous relationship.
- Visualize Performance over time by workload that can be broken down by selecting specific partners.



Data cleaning

- Updated nulls to 0 for Bizapp active usage performance metrics.
- Counted number of active users so 0 is appropriate as opposed to a null value.
- Updated the key data from numbers to factors for grouping and graphing.
- Removed duplicate rows to prevent redundancies.



EDA Summary

- Just over half of all customers belong to the one specific Vertical Key.

Percentage of Vertical Key Frequency:

167511991: **50.5%**

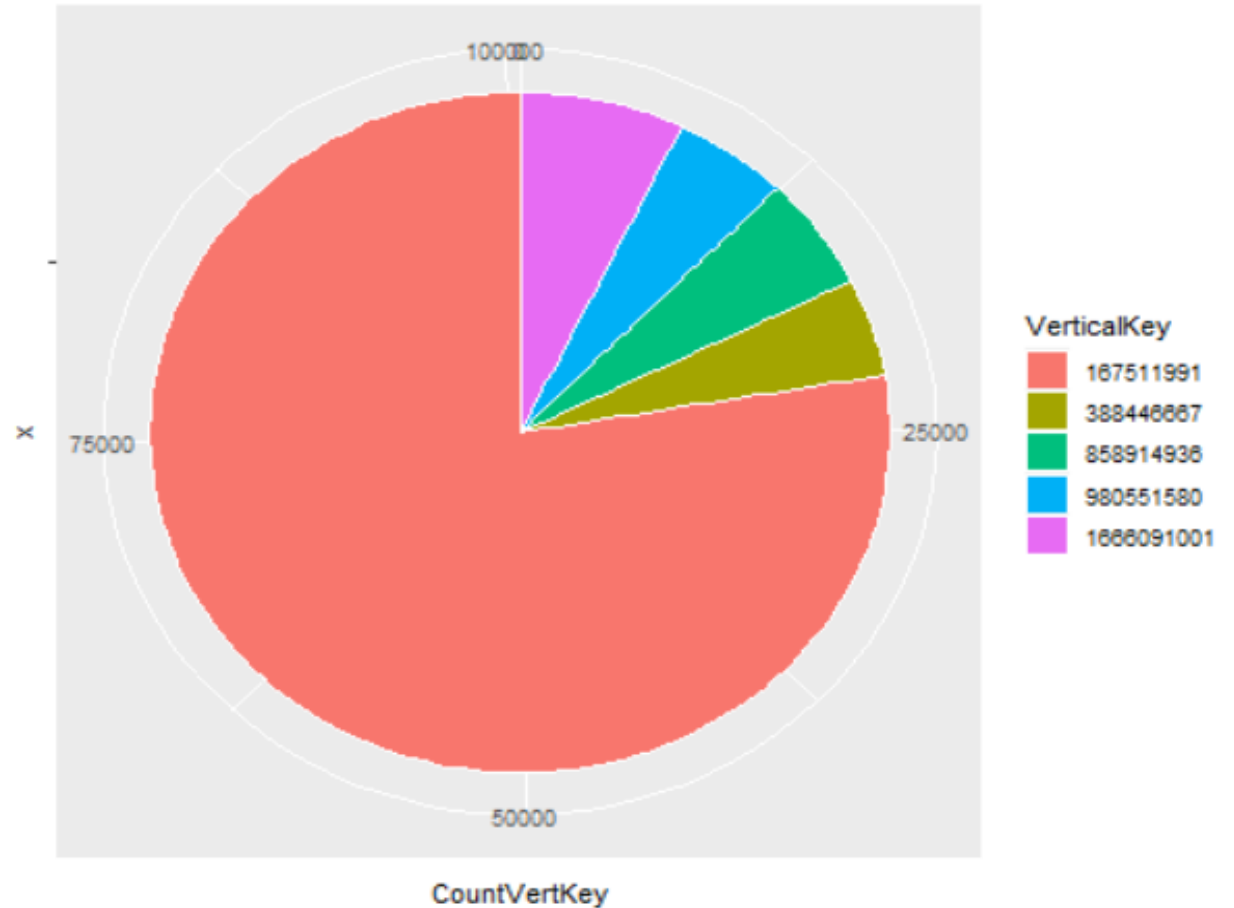
1666091001: **4.6%**

858914936: **3.5%**

980551580: **3.3%**

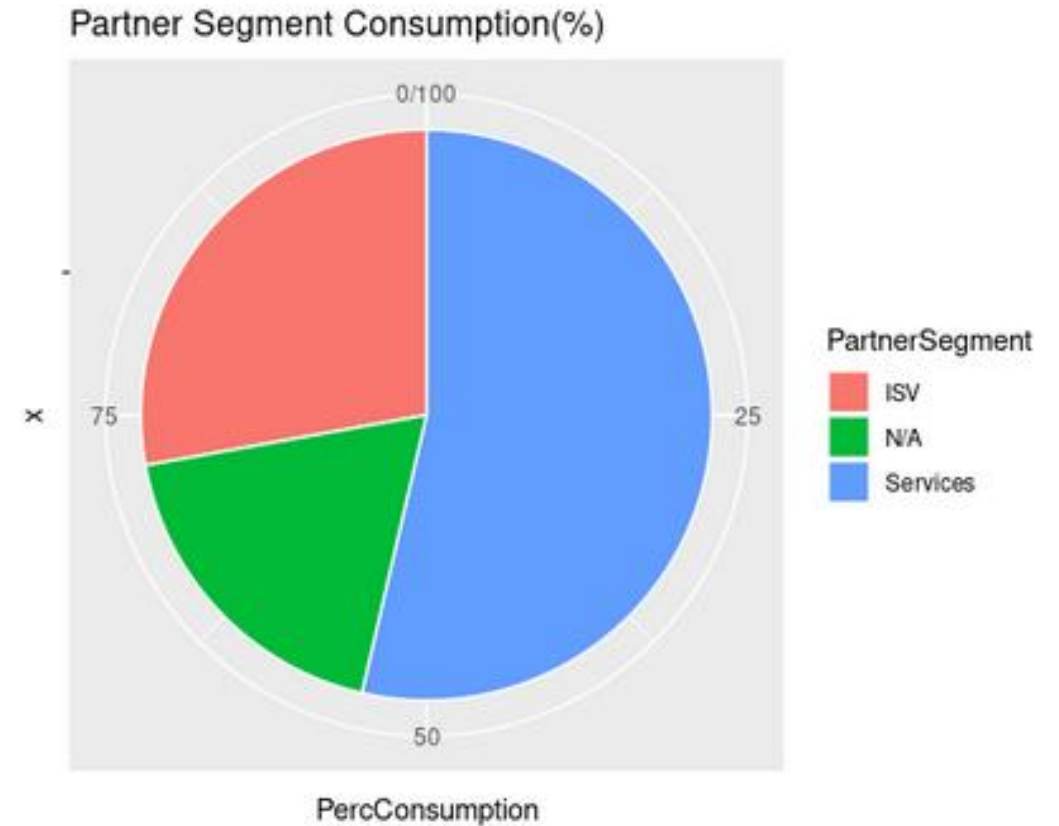
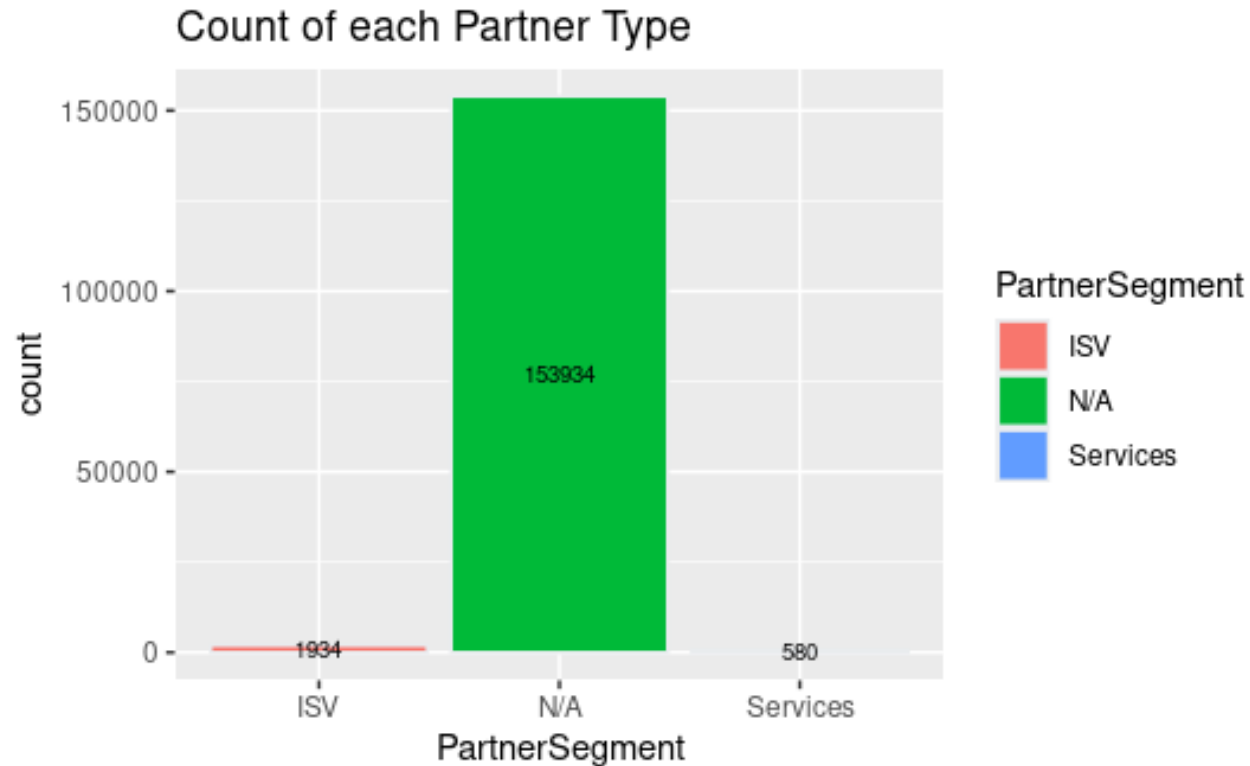
388446667: **3.0%**

Number of Customers per top 5 Vertical Key



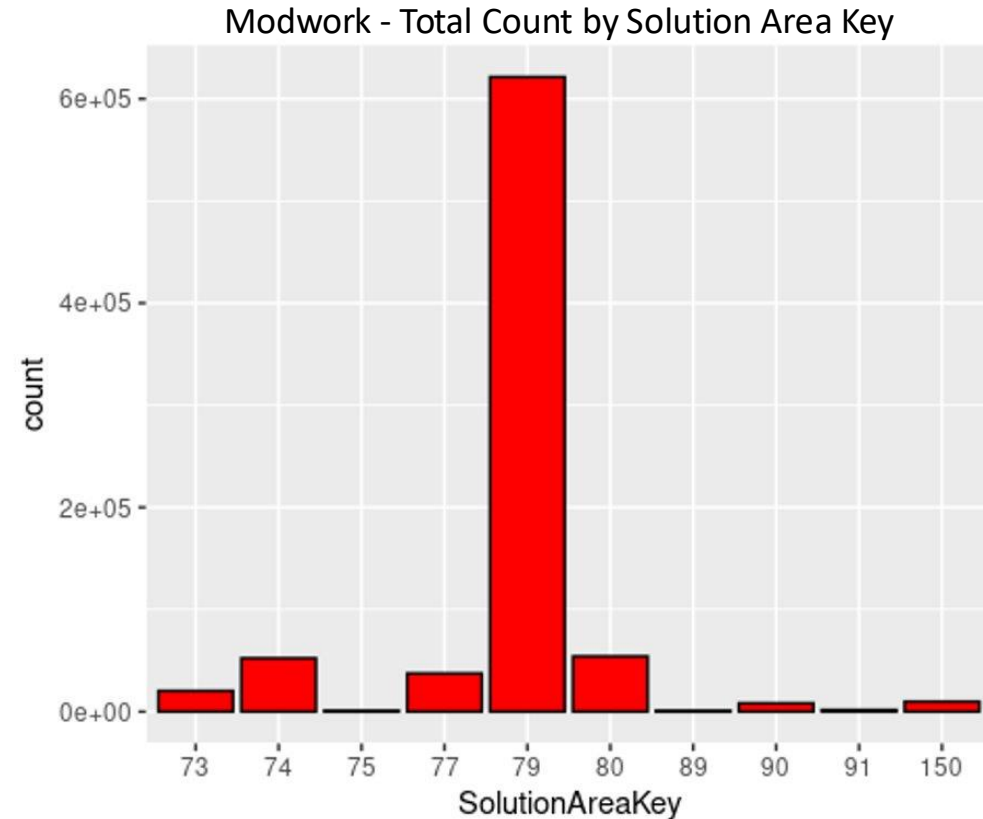
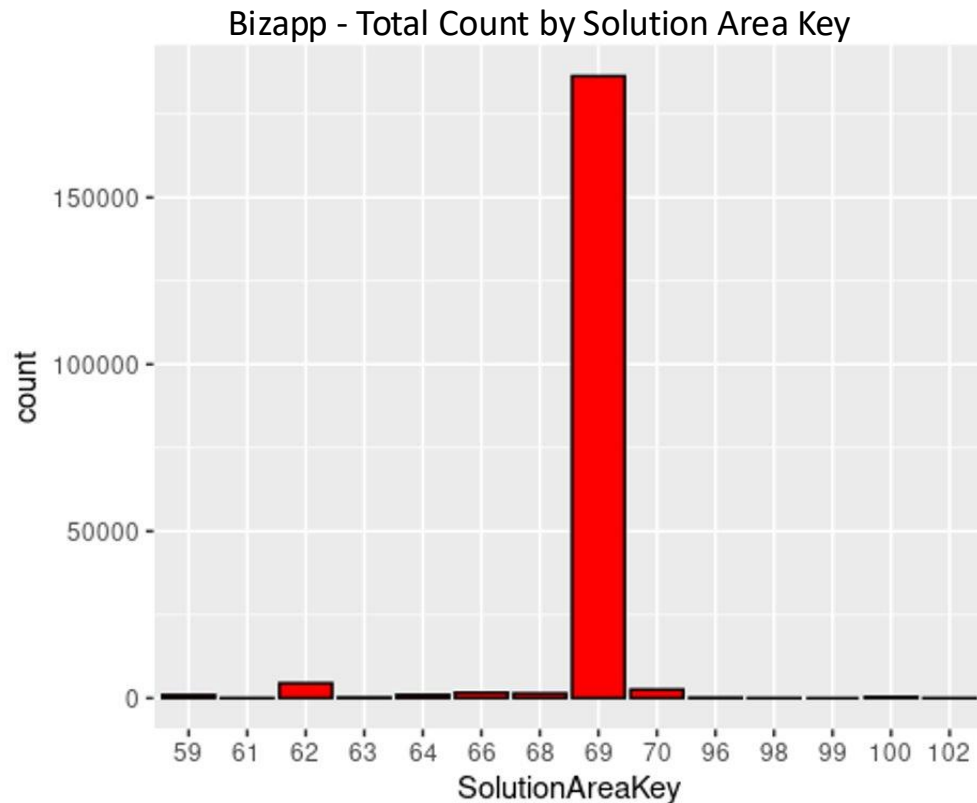
EDA Summary (cont.)

- The 'Services' Partner Segment had the lowest frequency but had the highest consumption in comparison to ISV and other.



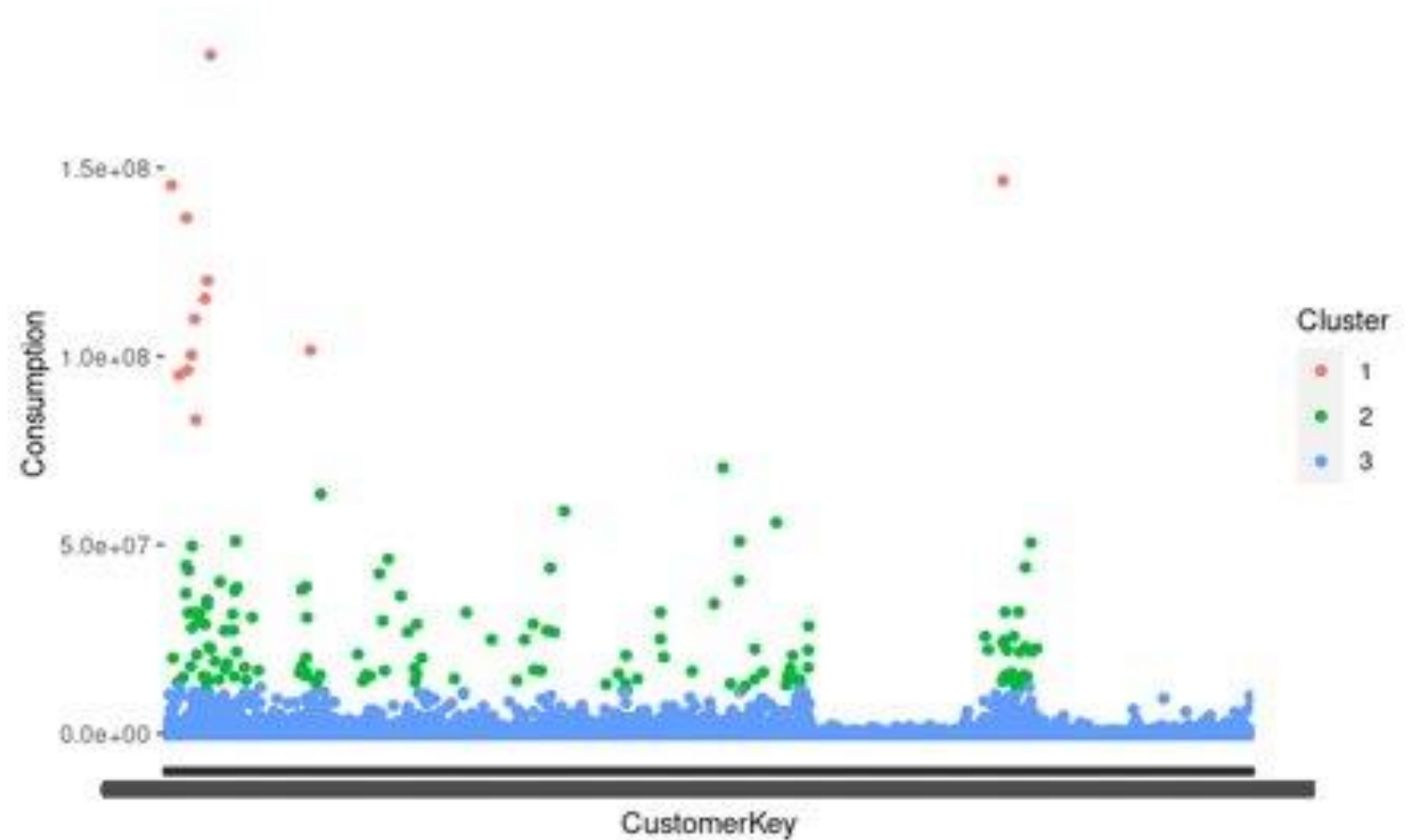
EDA Summary (cont.)

- For Bizapp and Modwork each, the vast majority of users belong to one particular Solution Area Key



EDA Summary (cont.)

- A small number of customers drove a significant amount of revenue.
- Derived using kNN-clustering.



Methodologies - Principal component analysis

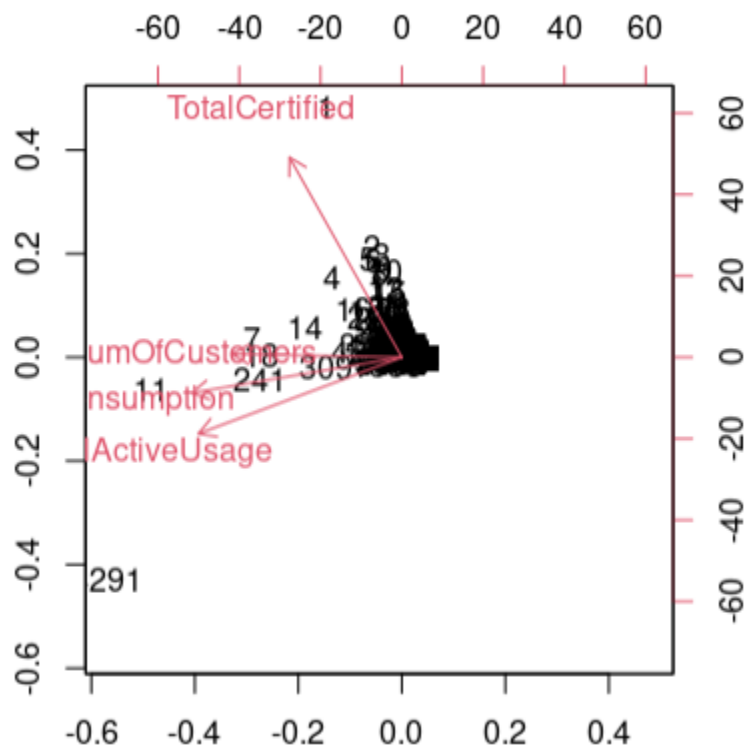
- PCA was used on the partner success metrics (consumption, number of customers, number of certifications, active usage or revenue depending on the workload) to create a score for each partner. This score would be used for ranking solutions associated with a specific partner with their corresponding score.

```
Rotation (n x k) = (4 x 4):
      PC1      PC2      PC3      PC4
Revenue      -0.5173293  0.4837108 -0.05794450 -0.70358843
TotalConsumption -0.4862999 -0.5024007  0.71339734 -0.04658529
NumOfCustomers  -0.4755390 -0.5342170 -0.69777288  0.03984698
TotalCertified  -0.5193702  0.4777338  0.02863005  0.70795857
Standard deviations (1, .., p=4):
[1] 1.7497182 0.8531505 0.4380808 0.1367691

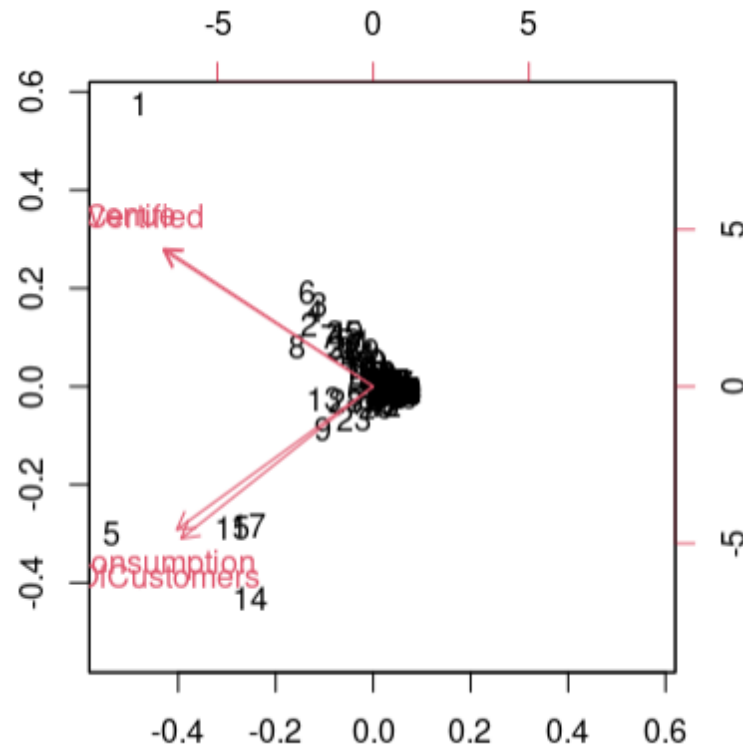
Rotation (n x k) = (4 x 4):
      PC1      PC2      PC3      PC4
ActiveUsage    -0.5478355 -0.1626167  0.53362504 -0.623439194
TotalConsumption -0.5569142 -0.1897207  0.26355847  0.764453813
NumberOfCustomers -0.5217645 -0.2425610 -0.80125463 -0.164064080
TotalCertified  -0.3427605  0.9374039 -0.06141888  0.004113004
Standard deviations (1, .., p=4):
[1] 1.5382962 0.9350543 0.7736209 0.4010350

Rotation (n x k) = (4 x 4):
      PC1      PC2      PC3      PC4
TotalCertified  -0.3152018  0.92142103 -0.1806061 -0.13788590
Consumption     -0.5896294 -0.16384262 -0.3487728  0.70982412
NumOfCustomers  -0.4769189  0.01472557  0.8779745  0.03863056
TotalActiveUsage -0.5705553 -0.35202563 -0.2736782 -0.68967012
```

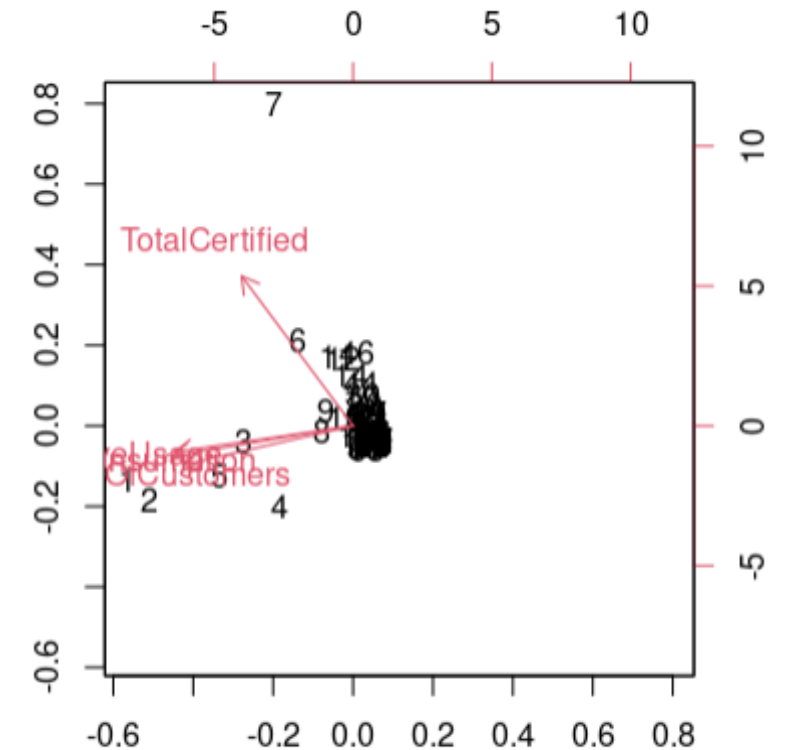
Methodologies - Principal component analysis (cont.)



BizApp Biplot



Azure Biplot

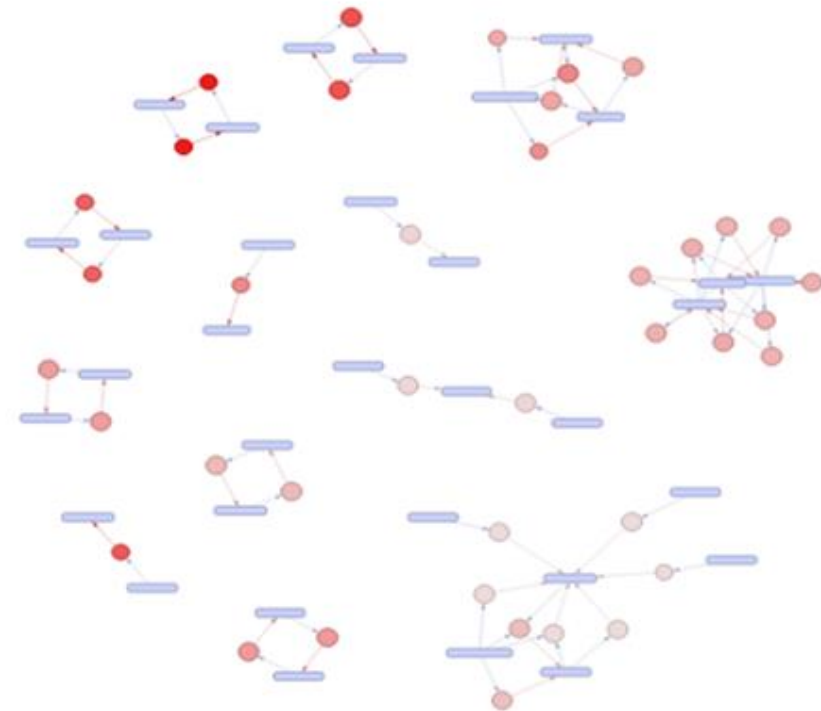


Modwk Biplot

Methodologies – Apriori Algorithm

Market Basket Analysis

- Support
 - How popular is the item?
- Confidence
 - How likely is an item to be purchased?
- Lift
 - How likely is an item to be purchased, while controlling for popularity of the other item?



Methodologies – Apriori Algorithm (cont.)

CustomerKey & SolutionKey

rules	support	confidence	coverage	lift	count
{CustomerKey=680336876} => {SolutionKey=24700}	0.001043	1.0000	0.001043	874.98	52
{SolutionKey=24700} => {CustomerKey=680336876}	0.001043	0.9123	0.001143	874.98	52
{CustomerKey=676972206} => {SolutionKey=17570}	0.001123	0.9492	0.001183	591.73	56
{CustomerKey=676952521} => {SolutionKey=2437}	0.001203	0.9375	0.001283	492.18	60
{CustomerKey=676953759} => {SolutionKey=108747}	0.001644	0.8119	0.002025	465.42	82
{SolutionKey=108747} => {CustomerKey=676953759}	0.001644	0.9425	0.001744	465.42	82
{CustomerKey=676977949} => {SolutionKey=21574}	0.002326	0.9508	0.002446	348.69	116
{SolutionKey=21574} => {CustomerKey=676977949}	0.002326	0.8529	0.002727	348.69	116
{CustomerKey=655011600} => {SolutionKey=17809}	0.001624	1.0000	0.001624	296.87	81
{CustomerKey=655100722} => {SolutionKey=28270}	0.001624	1.0000	0.001624	296.87	81
{CustomerKey=684917767} => {SolutionKey=28270}	0.001624	1.0000	0.001624	296.87	81
{CustomerKey=685057394} => {SolutionKey=17809}	0.001624	1.0000	0.001624	296.87	81
{CustomerKey=676967093} => {SolutionKey=39112}	0.002587	0.9699	0.002667	278.01	129
{CustomerKey=676992682} => {SolutionKey=21003}	0.001243	0.8267	0.001504	226.53	62
{CustomerKey=676953209} => {SolutionKey=109598}	0.004832	0.8368	0.005775	173.17	241
{SolutionKey=109598} => {CustomerKey=676953209}	0.004832	1.0000	0.004832	173.17	241
{CustomerKey=676965538} => {SolutionKey=10597}	0.001083	1.0000	0.001083	151.13	54
{CustomerKey=676965121} => {SolutionKey=149064}	0.001985	1.0000	0.001985	141.69	99
{CustomerKey=676959501} => {SolutionKey=149064}	0.001303	0.9155	0.001424	129.71	65
{CustomerKey=676972090} => {SolutionKey=21261}	0.008060	0.9950	0.008100	119.87	402
{SolutionKey=21261} => {CustomerKey=676972090}	0.008060	0.9710	0.008301	119.87	402
{CustomerKey=683841872} => {SolutionKey=23479}	0.002326	0.9355	0.002486	49.79	116
{CustomerKey=683173905} => {SolutionKey=5933}	0.017925	0.9644	0.018587	29.87	894
{CustomerKey=676952688} => {SolutionKey=6762}	0.046778	0.9325	0.050166	19.93	2333
{SolutionKey=6762} => {CustomerKey=676952688}	0.046778	1.0000	0.046778	19.93	2333
{CustomerKey=677028095} => {SolutionKey=26563}	0.022757	0.9965	0.022838	13.84	1135

CustomerKey & SolutionKey & SolutionAreaKey

rules	support	confidence	coverage	lift	count
{SolutionAreaKey=33} => {SolutionKey=23479}	0.018787	0.9842	0.019088	52.39	937
{SolutionKey=23479} => {SolutionAreaKey=33}	0.018787	1.0000	0.018787	52.39	937
{SolutionAreaKey=68} => {SolutionKey=33531}	0.023620	0.9776	0.024161	41.39	1178
{SolutionKey=33531} => {SolutionAreaKey=68}	0.023620	1.0000	0.023620	41.39	1178
{SolutionKey=15068} => {SolutionAreaKey=85}	0.018868	1.0000	0.018868	40.12	941
{SolutionAreaKey=89} => {SolutionKey=20174}	0.022096	0.8529	0.025905	38.60	1102
{SolutionKey=20174} => {SolutionAreaKey=89}	0.022096	1.0000	0.022096	38.60	1102
{CustomerKey=683173905,SolutionAreaKey=77} => {SolutionKey=5933}	0.017925	1.0000	0.017925	30.98	894
{SolutionAreaKey=38} => {SolutionKey=7411}	0.010787	1.0000	0.010787	30.90	538
{CustomerKey=683173905} => {SolutionKey=5933}	0.017925	0.9644	0.018587	29.87	894
{SolutionAreaKey=2} => {SolutionKey=10208}	0.033925	0.9181	0.036953	27.06	1692
{SolutionKey=10208} => {SolutionAreaKey=2}	0.033925	1.0000	0.033925	27.06	1692
{SolutionAreaKey=84} => {SolutionKey=36834}	0.031981	0.8269	0.038677	25.85	1595
{SolutionKey=36834} => {SolutionAreaKey=84}	0.031981	1.0000	0.031981	25.85	1595
{CustomerKey=683173905,SolutionKey=5933} => {SolutionAreaKey=77}	0.017925	1.0000	0.017925	22.61	894
{SolutionKey=5933} => {SolutionAreaKey=77}	0.032281	1.0000	0.032281	22.61	1610
{CustomerKey=683173905} => {SolutionAreaKey=77}	0.017925	0.9644	0.018587	21.80	894
{CustomerKey=676952688,SolutionAreaKey=26} => {SolutionKey=6762}	0.046778	0.9991	0.046818	21.36	2333
{CustomerKey=676952688} => {SolutionKey=6762}	0.046778	0.9325	0.050166	19.93	2333
{SolutionKey=6762,SolutionAreaKey=26} => {CustomerKey=676952688}	0.046778	1.0000	0.046778	19.93	2333
{SolutionKey=6762} => {CustomerKey=676952688}	0.046778	1.0000	0.046778	19.93	2333
{CustomerKey=676952688,SolutionKey=6762} => {SolutionAreaKey=26}	0.046778	1.0000	0.046778	19.93	2333
{SolutionAreaKey=26} => {SolutionKey=6762}	0.046778	0.9135	0.051209	18.22	2333
{SolutionKey=6762} => {SolutionAreaKey=26}	0.046778	1.0000	0.046778	19.93	2333
{CustomerKey=676952688} => {SolutionAreaKey=26}	0.046818	0.9333	0.050166	18.22	2335
{SolutionAreaKey=26} => {CustomerKey=676952688}	0.046818	0.9143	0.051209	18.22	2335
{SolutionAreaKey=45} => {SolutionKey=10889}	0.052232	0.8494	0.061495	16.26	2605
{SolutionKey=10889} => {SolutionAreaKey=45}	0.052232	1.0000	0.052232	16.26	2605
{CustomerKey=677028095,SolutionAreaKey=32} => {SolutionKey=26563}	0.022757	1.0000	0.022757	13.89	1135
{CustomerKey=677028095} => {SolutionKey=26563}	0.022757	0.9965	0.022838	13.84	1135
{SolutionAreaKey=44} => {SolutionKey=17546}	0.069074	0.8636	0.079982	6.25	3445
{SolutionKey=27928} => {SolutionAreaKey=0}	0.029434	1.0000	0.029434	5.51	1468
{SolutionKey=36541} => {SolutionAreaKey=0}	0.022216	1.0000	0.022216	5.51	1108
{CustomerKey=677028095,SolutionKey=26563} => {SolutionAreaKey=32}	0.022757	1.0000	0.022757	4.06	1135

Methodologies – Apriori Algorithm (cont.)

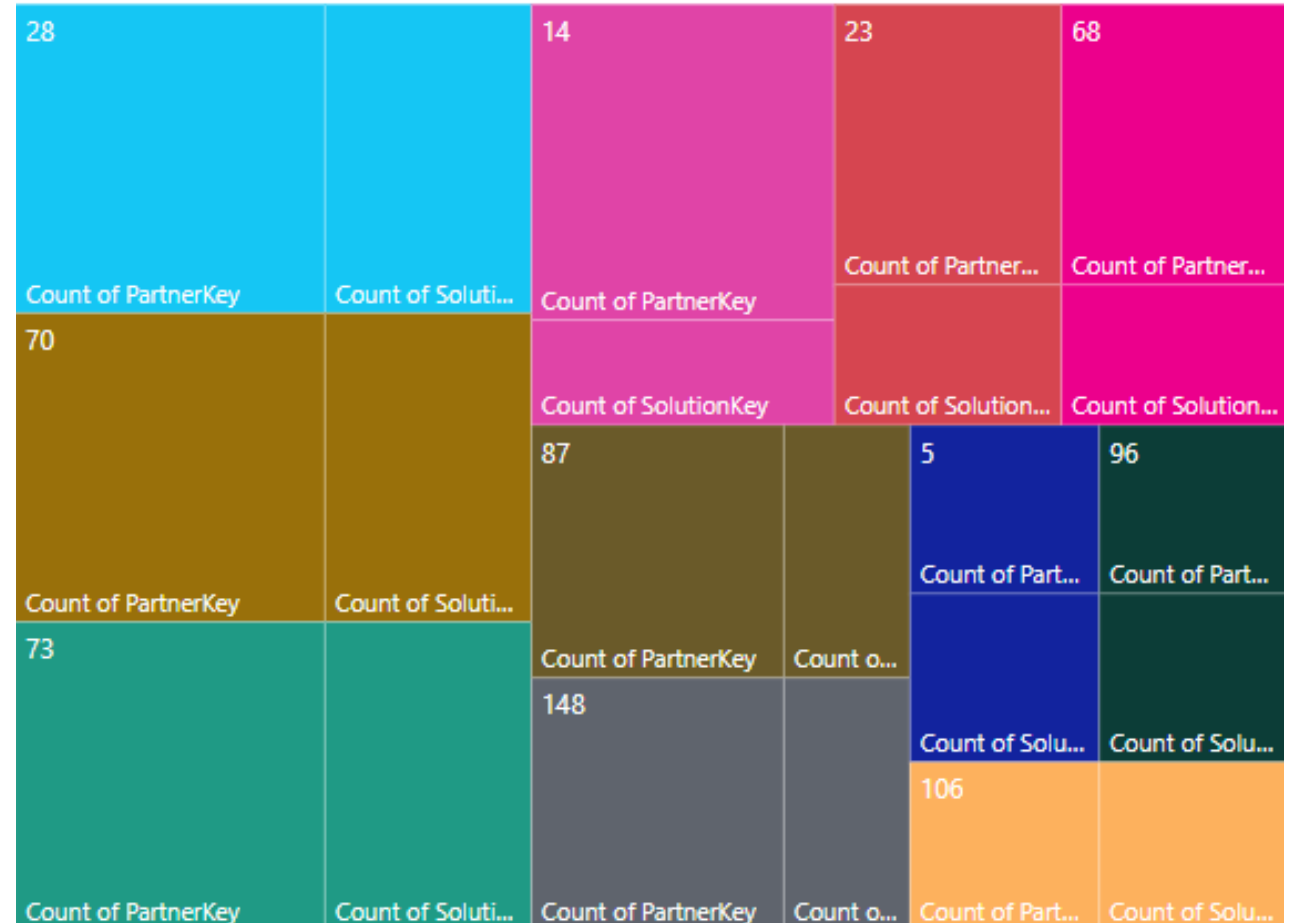
Conclusions

- Interesting angle to take
- Does not translate as hoped
- Unable to confirm effectiveness

Solutions & IP Gaps

- Reverse treemap showing all solution area keys with less than three solutions and partners

Count of PartnerKey and Count of SolutionKey by SolutionAreaKey



Solutions & IP Gaps

- Table contains solution area keys corresponding to treemap
- Average score of partners in particular solution area is displayed to estimate demand

SolutionAreaKey	Count of SolutionKey	Count of PartnerKey	Workload	Average of Score
68	1	2	Bizapp	20.66
70	2	3	Bizapp	14.51
148	1	2	Modwrk	8.29
23	1	2	Azure	7.77
87	1	2	Modwrk	7.43
73	2	3	Modwrk	5.29
28	2	3	Azure	3.16
96	1	1	Bizapp	2.54
14	1	3	Azure	1.61
106	1	1	Azure	0.87
5	1	1	Azure	0.51
Total	13	23		7.21

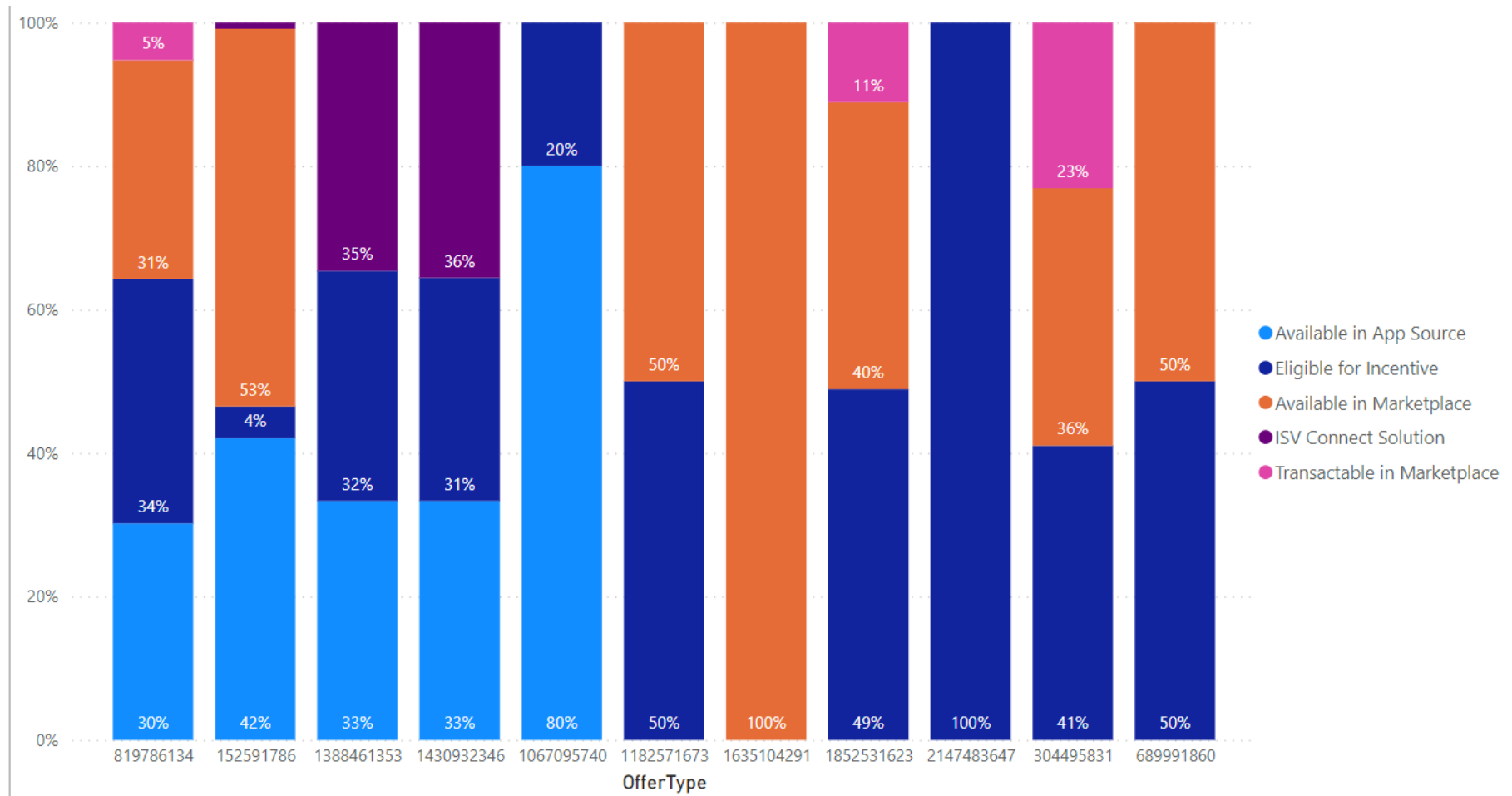
Choosing an Offer Type

- The Partner solutions provide different offer types composed of features that may help incentivize the customer into making a purchase.
- There are currently 11 live offer types used right now, with different breakdown in features.
- By comparing the offers, the partners could see what is that could be used or adapted to the customer's situations.

Choosing an Offer Type

- Of the active offers, 248 are confirmed live, with an additional 26 unconfirmed.
- Offer 819786134 was the most popular, being utilized 128 times.
- Availability in the marketplace was the used feature, being in 58% of the live offers
- Incentive Eligibility and Availability in AppSource were the next most popular features, both being featured in about 57% and 55% of the live offers.

Offer Type by Feature



Results & Conclusions

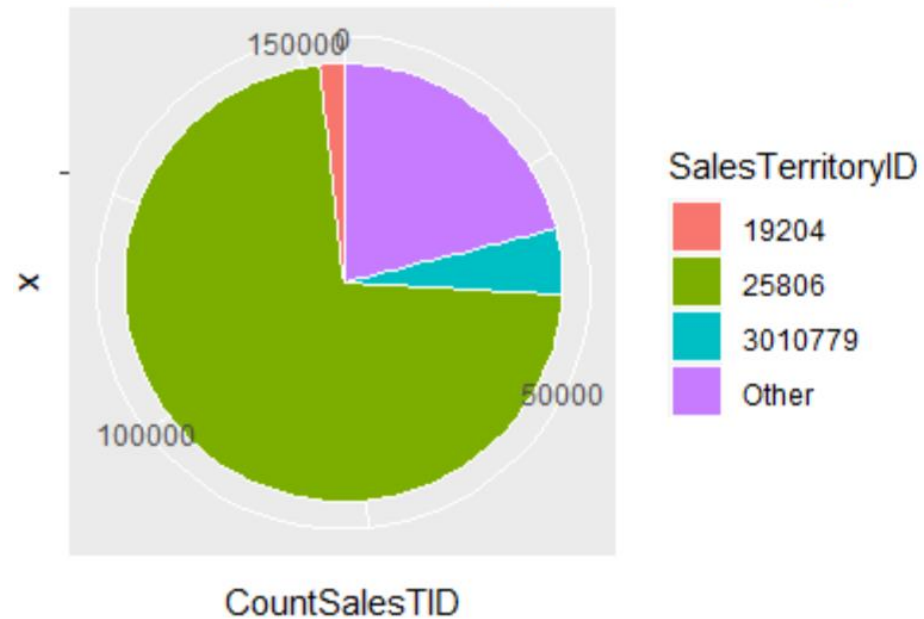
Results & Conclusions (cont.)

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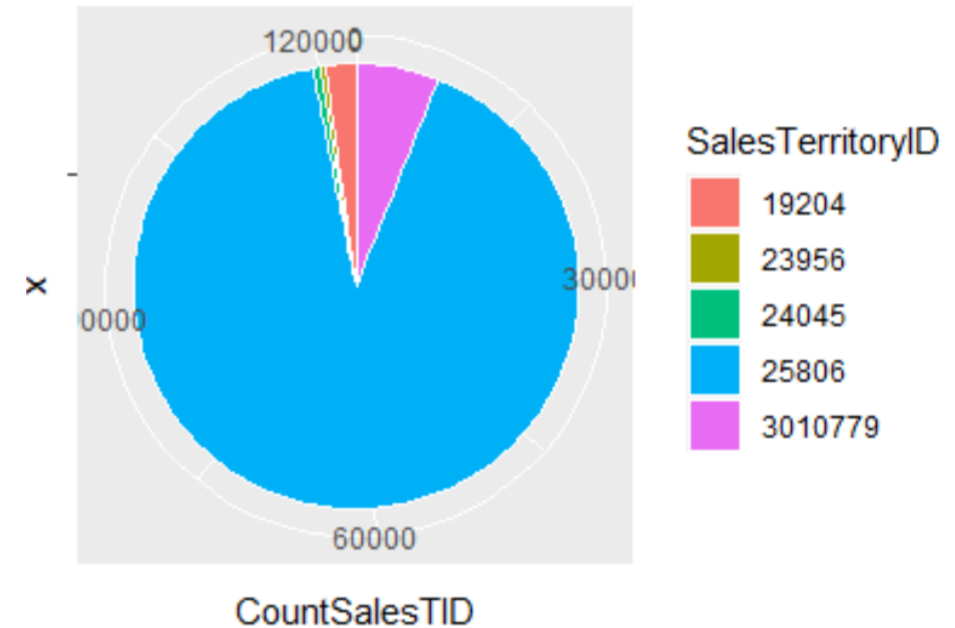
Results & Conclusions (cont.)

Sales Territory Graphs

Number of Customers per Sales Territory IDs



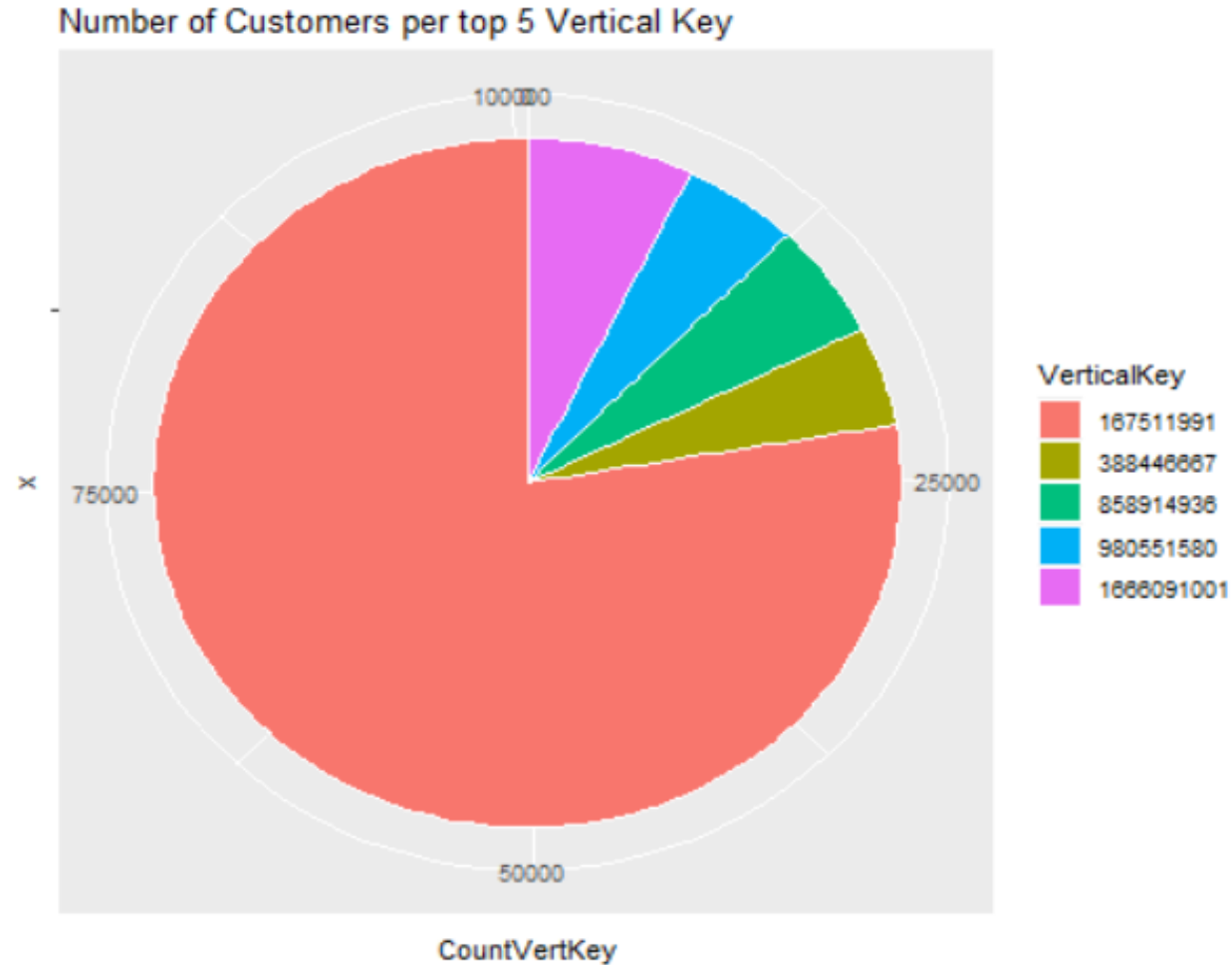
Number of Customers per top 5 Sales Territory IDs



Number of Customers by industry (Vertical Key)

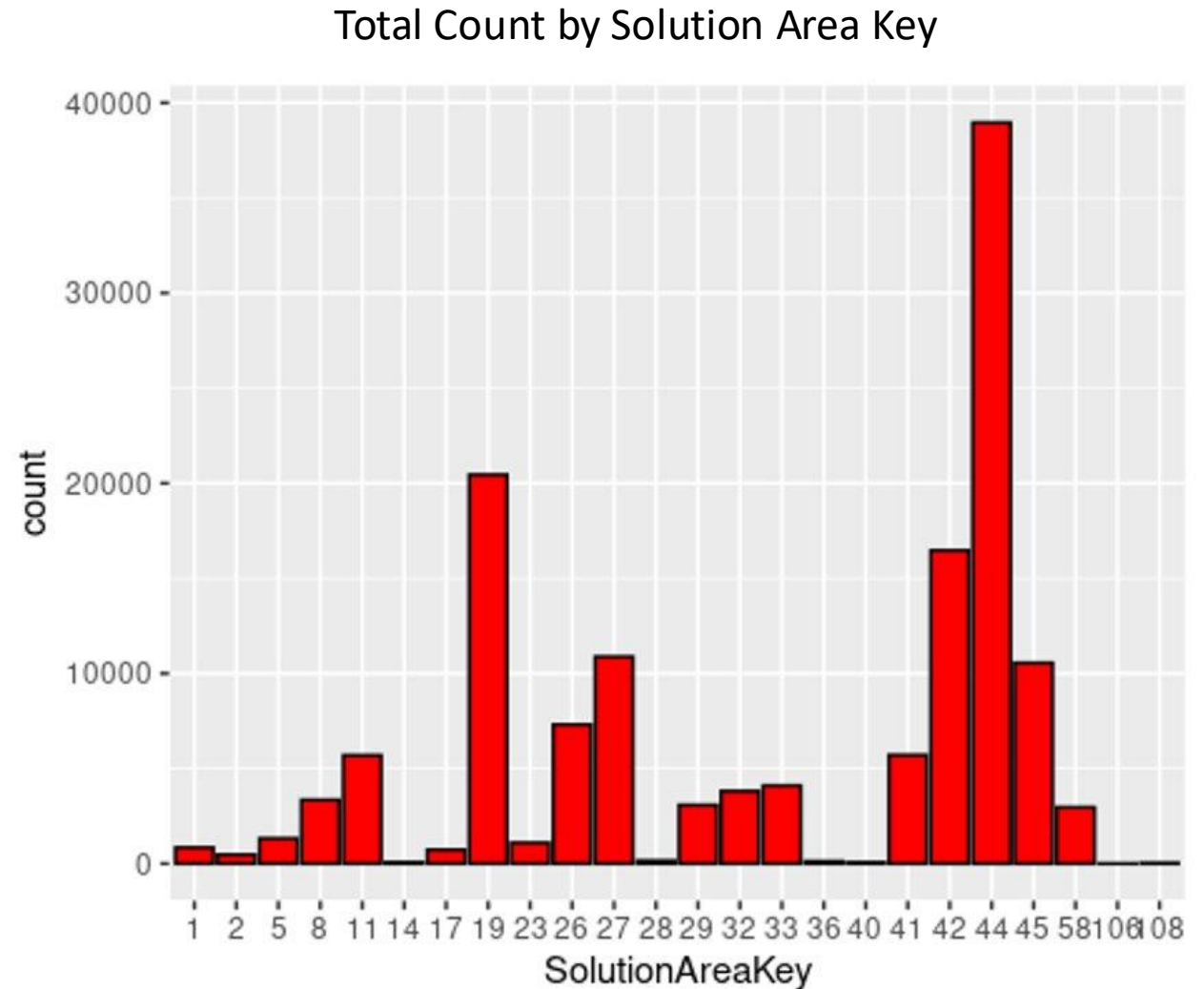
Percentage of
Vertical Key
Frequency

167511991	:50.5%
1666091001	: 4.6%
858914936	: 3.5%
980551580	: 3.3%
388446667	: 3.0%



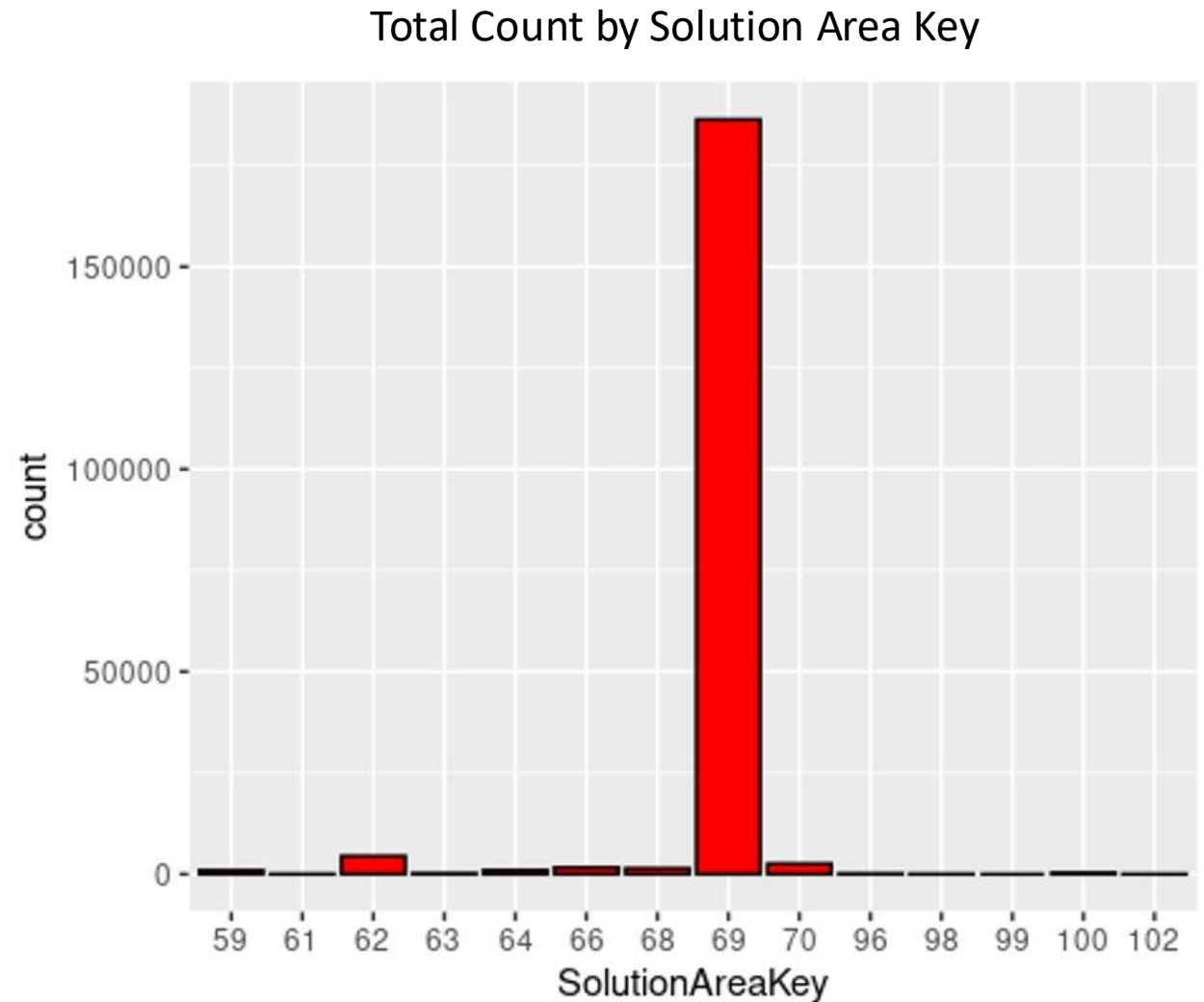
Performance - AZURE

- Sum of Revenue -
\$1,586,472,292
- Average Revenue
 - Fiscal Month ID -
\$264,412,049
 - Solution Area Key -
\$66,103,012
 - Customer Key -
\$235,731
 - Partner Key -
\$12,203,633



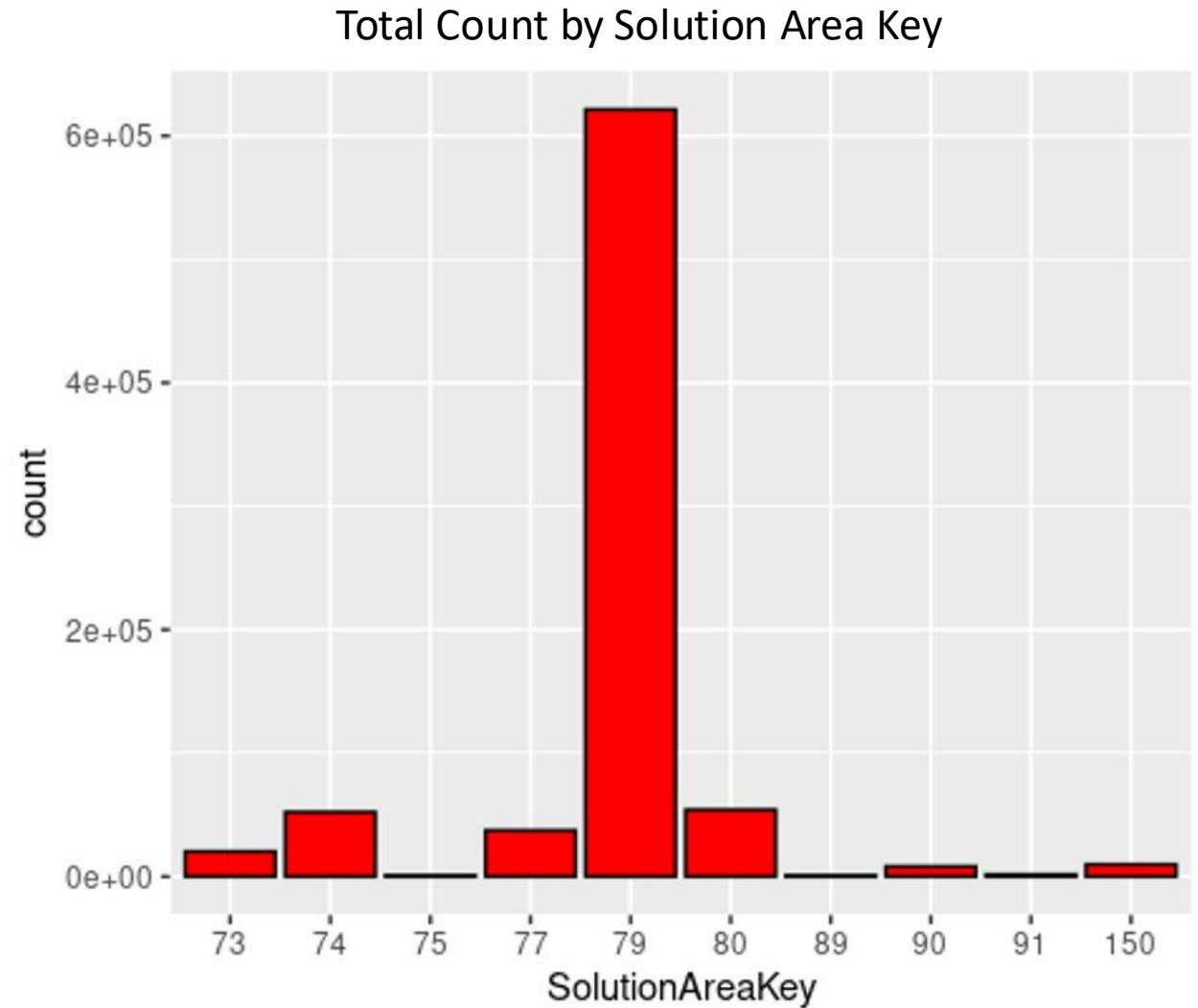
Performance - BIZAPP

- Sum of Active Users – 5,568,436
- Average Active Users
 - Fiscal Month ID – 1,113,687
 - Solution Area Key – 397,745
 - Customer Key - 174
 - Partner Key – 1,096



Performance- AZURE

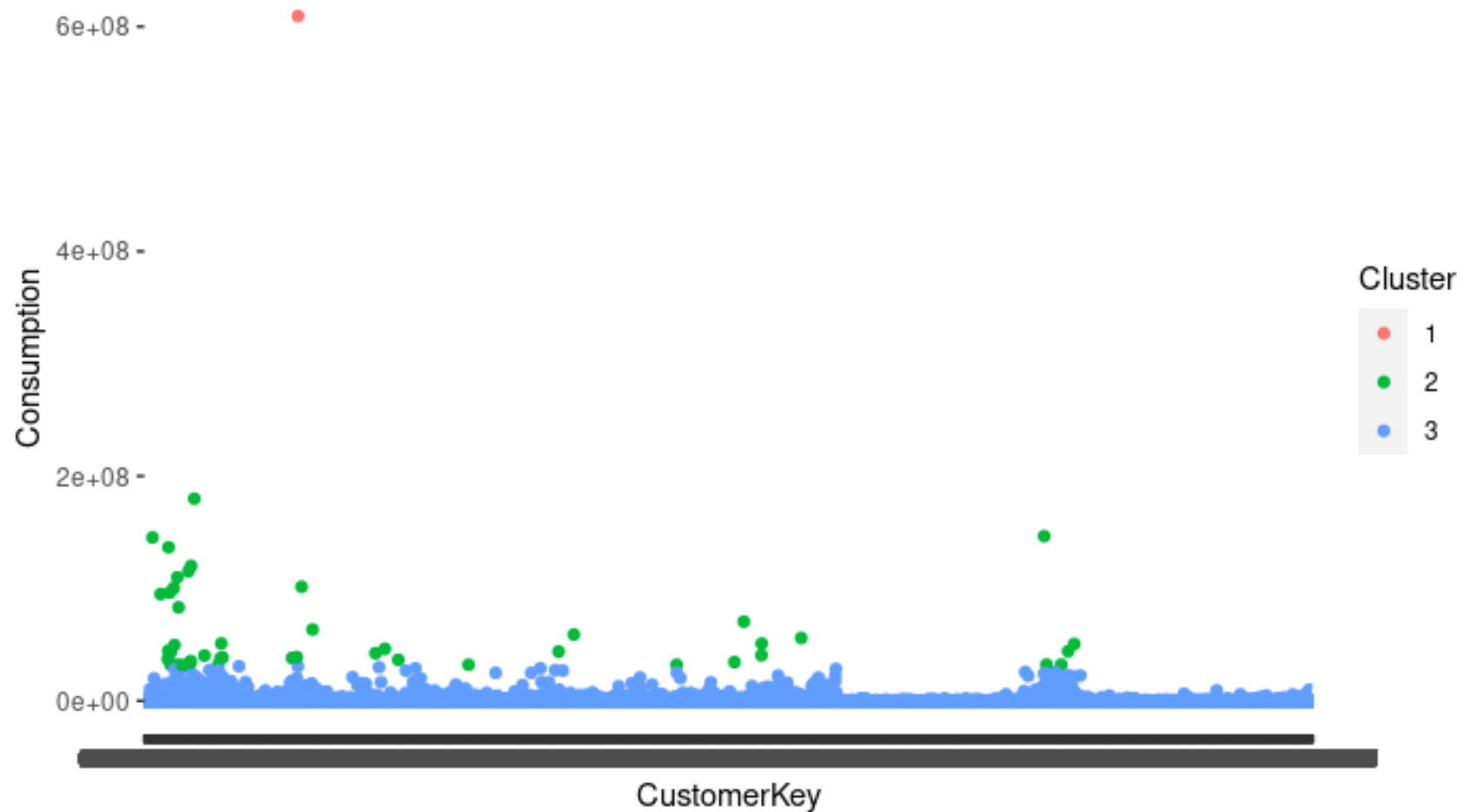
- Sum of Active Users – 853,051,765
- Average Active Users
 - Fiscal Month ID – 170,610,353
 - Solution Area Key – 85,305,176
 - Customer Key – 6,494
 - Partner Key – 12,014,814



Clustering Customers by Revenue

Method: KNN

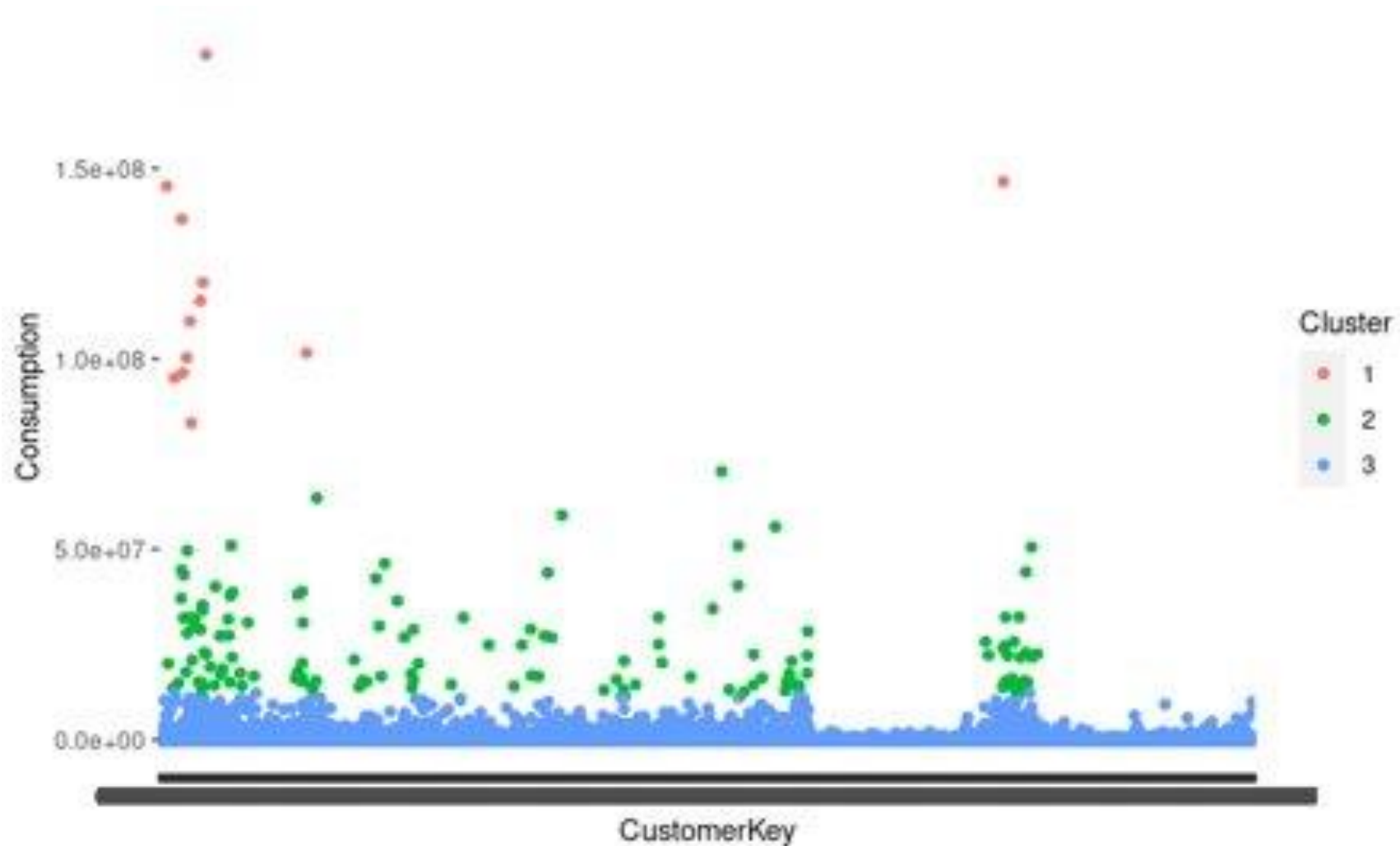
Clustering customer based on Consumption



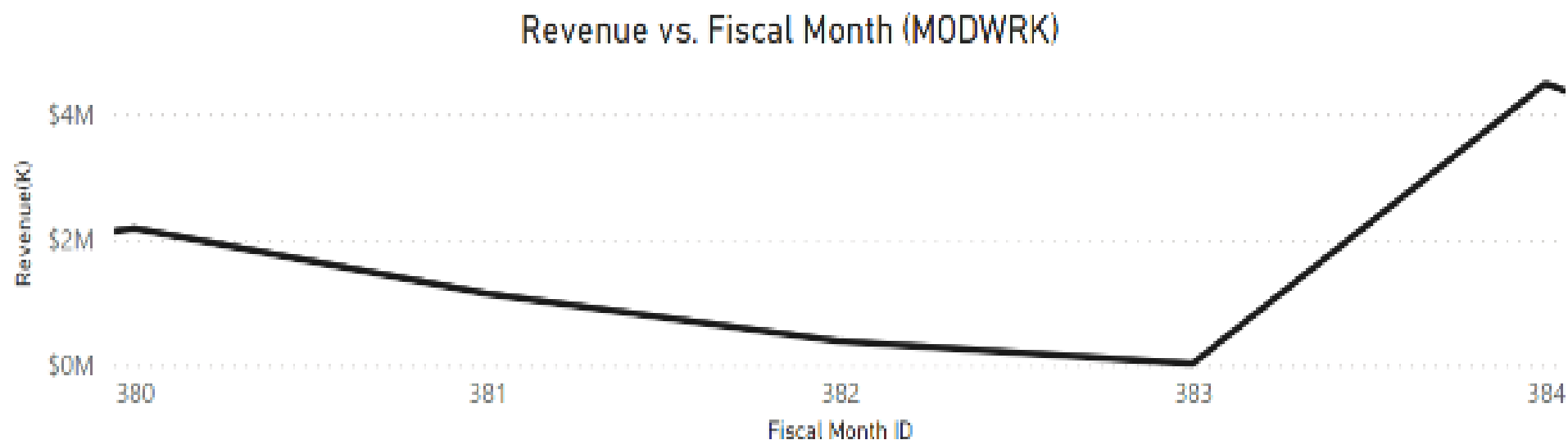
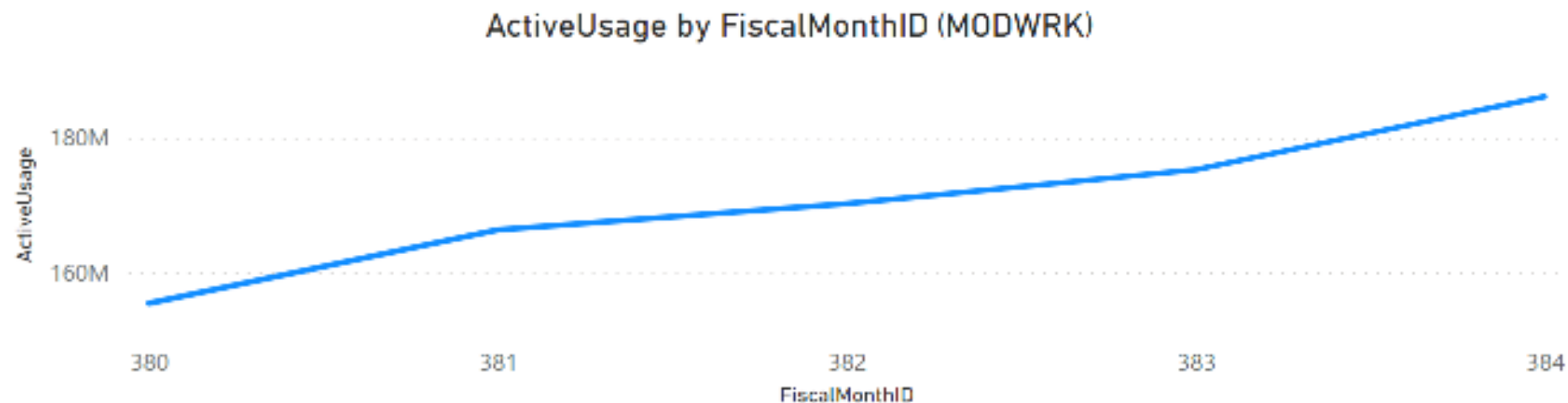
Clustering Customers by Revenue

Removing Outlier

Method: KNN



Active Usage and Revenue Over time



Active Usage and Revenue Over time

