

# **Wayfair Campaign Product Report Data Analysis**

**Yilin Huang**

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## 1. Introduction

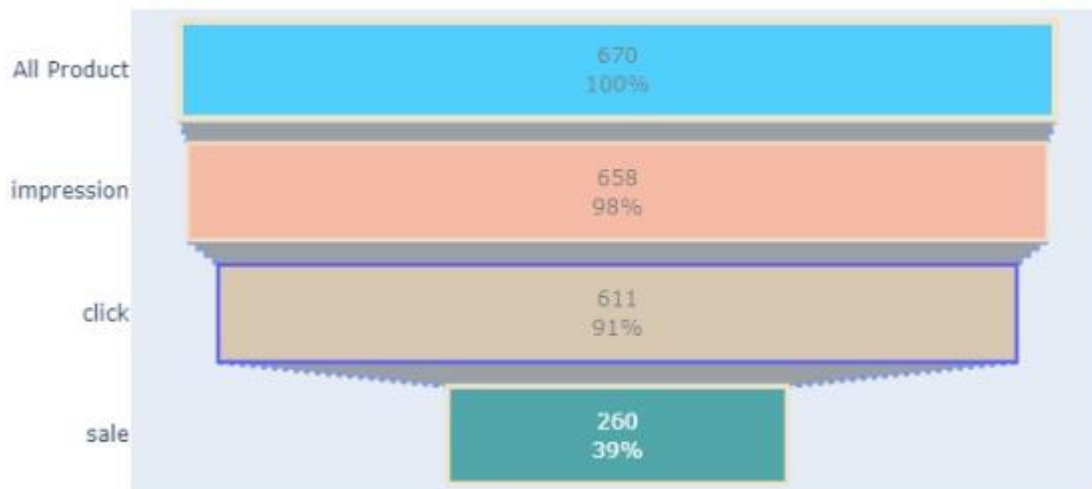
Sponsored Products is Wayfair's newest media opportunity, a program to offer a paid solution for suppliers seeking greater visibility of their products on wayfair.com.

It is an opportunity for boosted product placement on-site through a proprietary bid management system. Winning products will be pushed into high-performing slots on browse pages, positioned directly in front of customers.

The bid management system on the Supplier Extranet allows suppliers to boost their current products on wayfair.com through an auction model. Suppliers place their bids, and the winning products are boosted on-site and labeled with a "Sponsored" tag.

The goal for Wayfair Campaign Analytics is to find insights from the dataset from internal dashboard to help guide decisions around campaign optimization.

## 2. Problem Statement



# Funnel Graph in past campaigns

In this graph, we could clearly see that 39% products in the past campaign contribute to final sales. From this project, the purpose is to figure out why these 39% products contribute to the final sales and to find insights to support future decision making for the new campaigns.

### 3. Data Description

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 670 entries, 1 to 670
Data columns (total 21 columns):
 Campaign ID      670 non-null int64
 Wayfair SKU     656 non-null object
 Shop Classification 656 non-null object
 Product Name     670 non-null object
 Manufacturer Name 656 non-null object
 Collection Name  640 non-null object
 Primary Pattern  656 non-null object
 Well Woven Color 656 non-null object
 Start Date       670 non-null datetime64[ns]
 End Date         670 non-null datetime64[ns]
 Start_Month      670 non-null object
 Period           670 non-null timedelta64[ns]
 Impressions      670 non-null int64
 Clicks           670 non-null int64
 Avg. Daily Spend 670 non-null float64
 Attributed Sales 670 non-null float64
 Attributed Orders 670 non-null int64
 ROAS (%)         670 non-null float64
 CPC              670 non-null float64
 CTR (%)          670 non-null float64
 Total Spend      670 non-null float64
dtypes: datetime64[ns](2), float64(6), int64(4), object(8), timedelta64[ns](1)
memory usage: 115.2+ KB
```

#### # Dataset Description

There are 670 records and 21 features in this dataset. I filtered out 'Store','Class','Status', 'Supplier Part Numbers'. For the reason that these columns have the same value for each record and duplicated information.

|   | Wayfair SKU | Shop Classification | Product Name                     | Manufacturer Name | Collection Name | Primary Pattern | Well Woven Color |
|---|-------------|---------------------|----------------------------------|-------------------|-----------------|-----------------|------------------|
| 1 | ANDOS748    | ANDO                | Devon Wine/Beige Border Area Rug | Andover Mills     | Devon           | Geometric       | Red              |
| 2 | ANDOS748    | ANDO                | Devon Wine/Beige Border Area Rug | Andover Mills     | Devon           | Geometric       | Red              |
| 3 | ASTG5537    | ASTG                | Colindale Red/Beige Area Rug     | Astoria Grand     | Colindale       | Oriental        | Red              |
| 4 | ASTG5537    | ASTG                | Colindale Red/Beige Area Rug     | Astoria Grand     | Colindale       | Oriental        | Red              |
| 5 | ASTG5537    | ASTG                | Colindale Red/Beige Area Rug     | Astoria Grand     | Colindale       | Oriental        | Red              |

#### Categorical Data

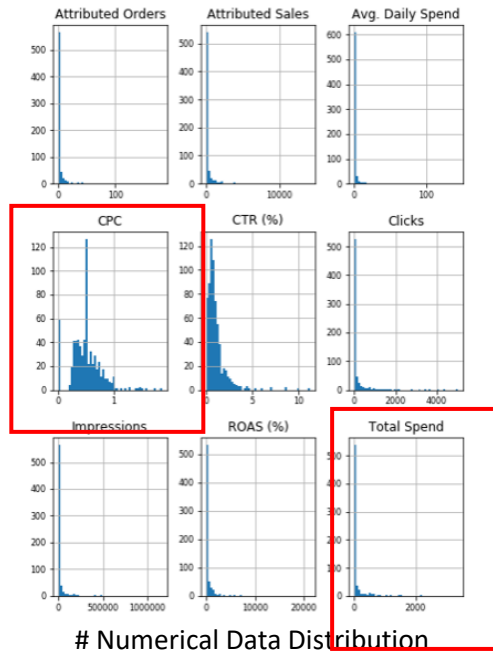
| Impressions | Clicks | Avg. Daily Spend | Attributed Sales | Attributed Orders | ROAS (%) | CPC | CTR (%) | Total Spend |
|-------------|--------|------------------|------------------|-------------------|----------|-----|---------|-------------|
| 0           | 0      | 0.0              | 0.0              | 0                 | 0.0      | 0.0 | 0.0     | 0.0         |
| 0           | 0      | 0.0              | 0.0              | 0                 | 0.0      | 0.0 | 0.0     | 0.0         |
| 0           | 0      | 0.0              | 0.0              | 0                 | 0.0      | 0.0 | 0.0     | 0.0         |
| 0           | 0      | 0.0              | 0.0              | 0                 | 0.0      | 0.0 | 0.0     | 0.0         |
| 0           | 0      | 0.0              | 0.0              | 0                 | 0.0      | 0.0 | 0.0     | 0.0         |

#### # Numerical Data

|   | Start Date | End Date   | Start_Month | Period_Week |
|---|------------|------------|-------------|-------------|
| 1 | 2019-02-01 | 2019-03-31 | Feb         | 8           |
| 2 | 2019-04-04 | 2019-10-07 | Apr         | 26          |
| 3 | 2019-01-02 | 2019-01-31 | Jan         | 4           |
| 4 | 2019-02-01 | 2019-03-31 | Feb         | 8           |
| 5 | 2019-04-04 | 2019-10-07 | Apr         | 26          |

#### #Date Data

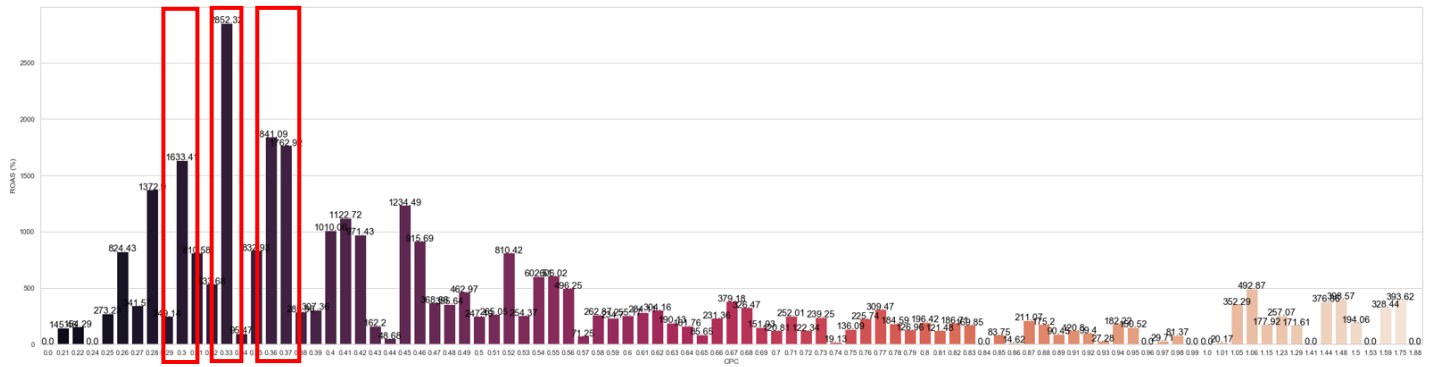
There are three types of data in this dataset: Categorical, numerical data and date data.



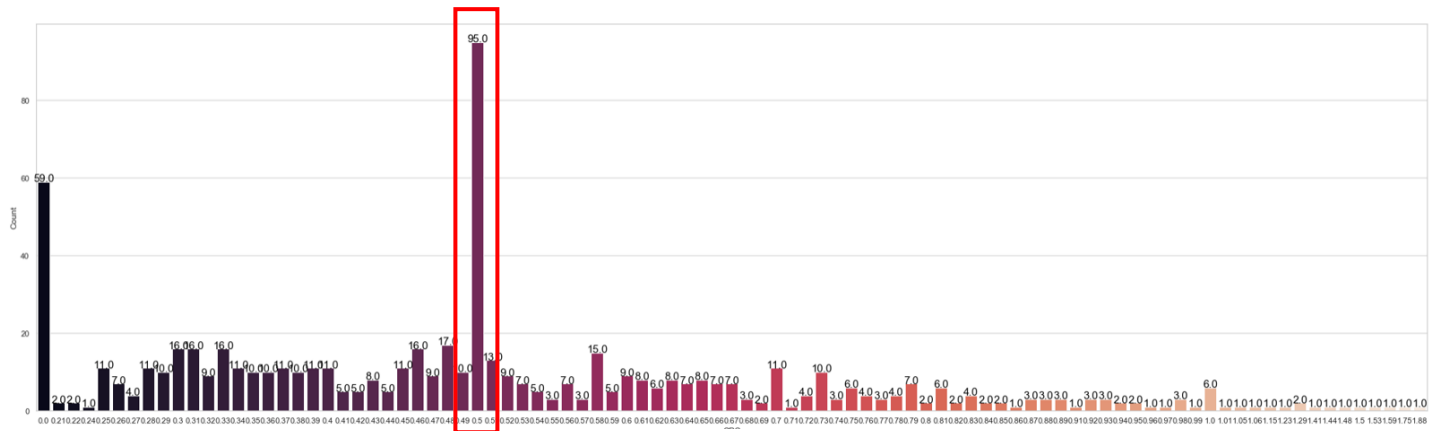
From the distribution of the numerical data, except the CPC and Total Spend, the results we expect in the future is that distributions could show upward trend.

## 4. Analytics

### 4.1 CPC Analytics



# Average ROAS for different CPC



# Count for different CPC

#### Description:

These charts describe the relationship between the CPC and ROAS.

#### Question:

Which price will have highest ROAS (%)?

#### Answer:

0.33, 0.36, 0.37 and 0.3

For Figure 1, I took the average value for each bidding price. From this chart, we could find that the prices which are 0.33, 0.36, 0.37 and 0.3 have top 4 good performance for the return which are 2852%, 1841%, 1762% and 1633%.

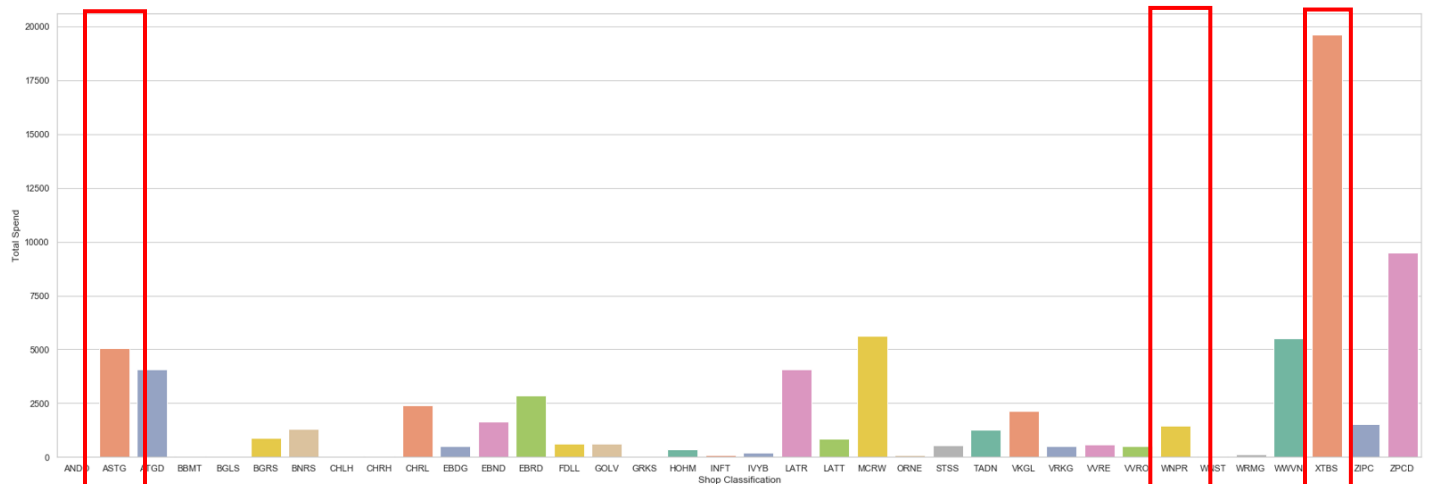
However, for Figure 2, I counted each price. This graph shows that prices which are 0.33, 0.36, 0.37 and 0.3 happened just a few instances around 10 times for each price. From Figure 2, the highest count which is 0.5 has the return which is 247% which is pretty low return.

#### Recommendation:

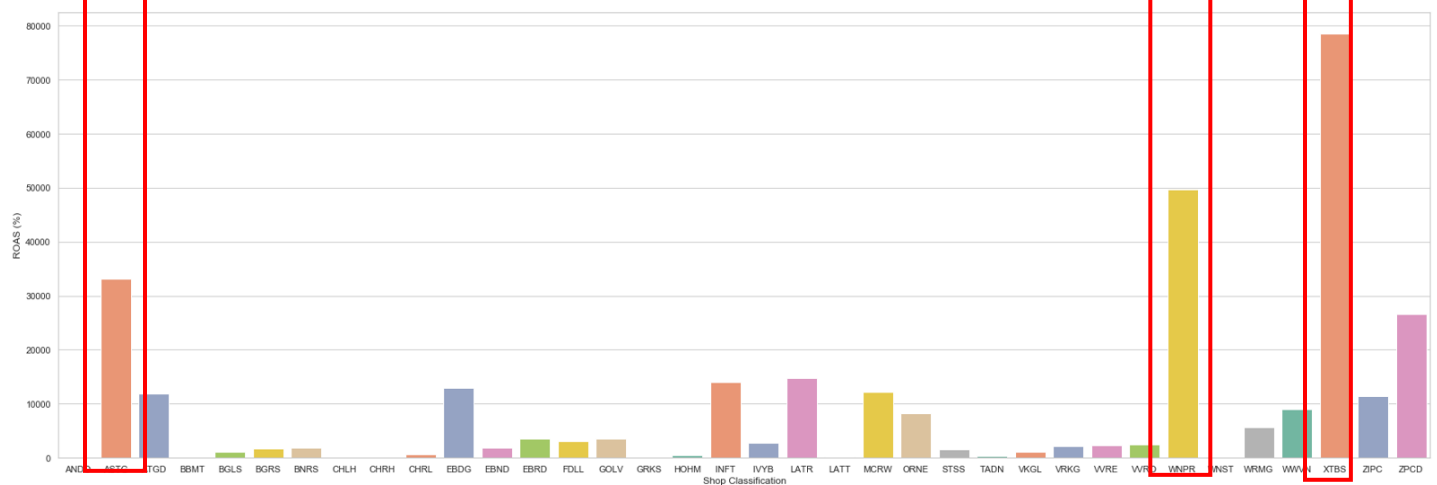
From the analytics above, the dataset is too small and imbalanced to generate strong conclusion which cost setting is the best. We still need to test more cost in order to get more valuable dataset to guide the CPC setting in the future. For the test CPC for next time, 0.33, 0.36, 0.37 and 0.3 are highly suggest set as maximum bidding price instead of 0.5 and to observe for their returns.

## 4.2 Categorical Data Exploration

### 4.2.1 Shop Classification Analytics for each campaign



# The total spending for each shop classification for difference campaign



# The total ROAS for each shop classification for difference campaign

#### Description:

These charts describe the different Shop Classification's Total Spend and ROAS (%).

#### Question:

Which Shop Classifications have good performance in the past campaigns?

#### Answer:

1. XTBS (Well Woven Shop)
2. ASTG
3. WNPR

For XTBS, we could observe that we invest a lot in the past campaigns and we get more return from this investment. For and ASTG and WNPR, we did not invest too much in the past, but we also could observe that we receive more return for WNPR than other Shop Classification.

## Recommendation:

From the analytics above. We could see that except XTBS (well woven shop), ASTG and WNPR have good performance in ROAS. ASTG is a shop get tighter all kind of classic style furnitures and WNPR is a shop gets together all kind of traditional style furniture. Maybe next time, we could invest more classical and traditional style rugs in our new campaign.

## Appendix:

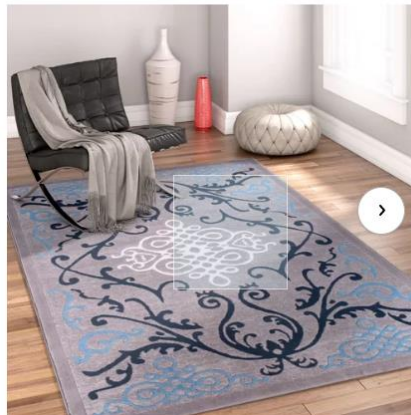
What is Shop Classification?

The Shop Classification is classified all the furniture with the same attributes by Wayfair. Take WNPR for example, WNPR is a shop gets together all kind of traditional style furniture with contemporary patterns and clean-lined silhouettes.

### Tori Blue Area Rug

See More from [Winston Porter Shop](#)

★★★★★ 183



\$139.99 ~~\$349.99~~ 60% Off

Pay as low as \$12 per month.

[Buy with Wayfair Financing](#)

Shopping for a business? Unlock insider pricing.



<https://www.wayfair.com/rugs/pdp/winston-porter-tori-blue-area-rug-wnpr1075.html?rtype=8&redir=WNPR1075&piid=21414187>

#### Customer Feedback

Quality 5k+  
Price 2k+  
Look 1k+

[See All Reviews](#)

#### About Winston Porter

Blending traditional style with contemporary patterns and clean-lined silhouettes, Winston Porter gives your home the best of both worlds. Classic designs and muted color palettes add familiar comfort and warmth, while bold geometric prints add a refreshing pop of chic style.

[Show Less](#)

### Winston Porter

66,967 Results

Category

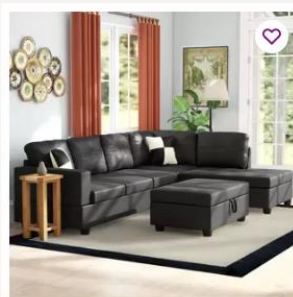
Special Offers

Price Per Item

Shop by Color

Customer Rating

Sort & Filter



+14 Colors | 2 Options

Maumee Sectional with Ottoman  
by Winston Porter

from \$587.31 ~~\$799.00~~

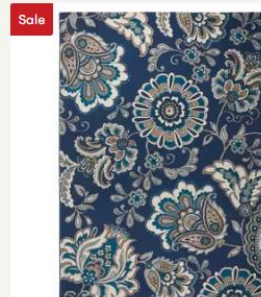
As low as \$49/mo. for 12 mos.\*\*



+15 Sizes

Albion Beige/Brown/Burgundy Area  
Rug  
by Winston Porter

\$20.49 - \$226.99 ~~\$22.00~~



+10 Sizes

Albion Floral Blue Area Rug  
by Winston Porter

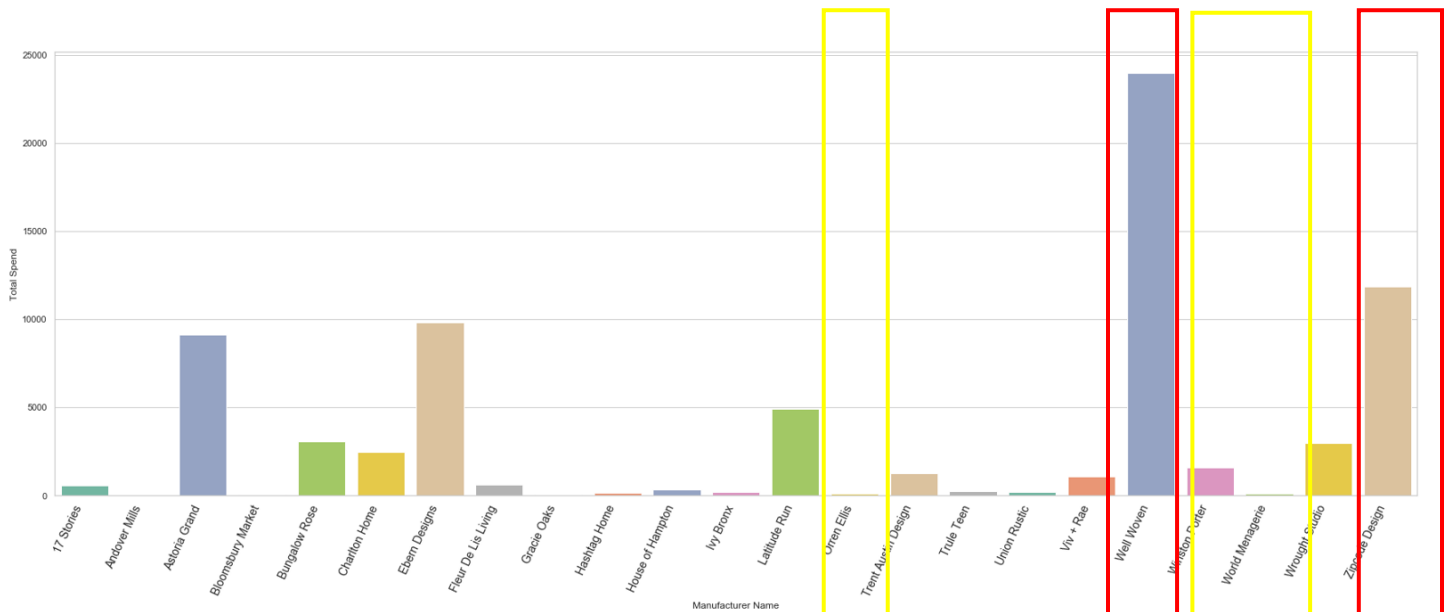
\$20.91 - \$183.99 ~~\$28.99~~

★★★★★ 6012

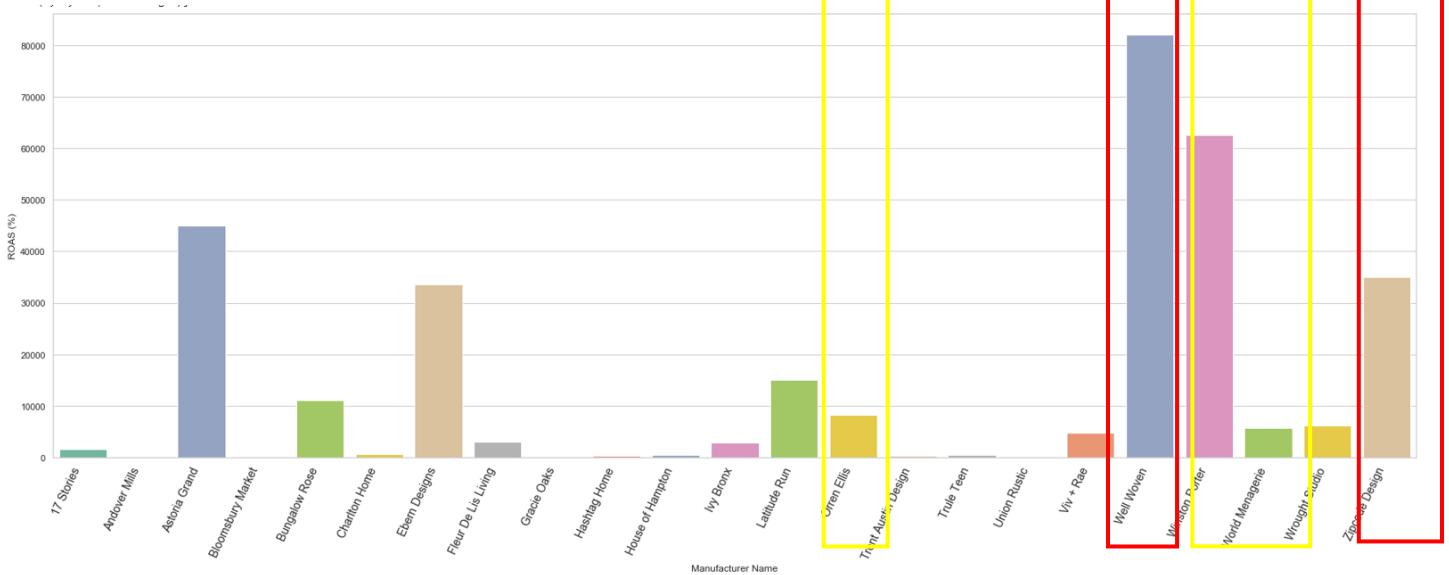
<https://www.wayfair.com/brand/bnd/winston-porter-b44326.html>



## 4.2.2 Manufacture Analytics



# The total spending for each Manufacture for difference campaign



# The ROAS for each Manufacture for difference campaign

### Description:

These charts describe the different Manufacture's Total Spend and ROAS (%).

### Question:

Which Manufactures have good performance in the past campaigns?

### Answer:

1. *Well Woven*
2. *Zipcode Design*
3. *Orren Ellis*

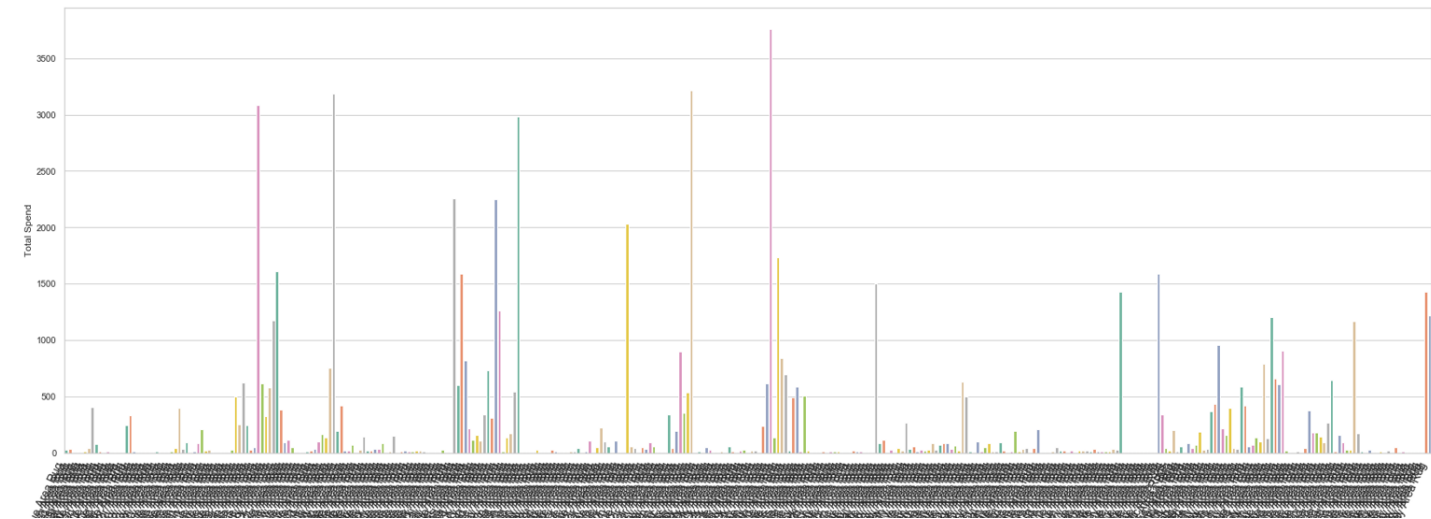
4. *Winston Porter*
5. *World Menagerie*

From the red shape we could see that we invested a lot for Well Woven and Zipcode Design. And at the same time, we could observe from the second chart that their products also have a good performance. The products produce by Orren Ellis, Winston Porter and World Menagerie, we barely spent money on them, but we could observe that we get some return from them surprise.

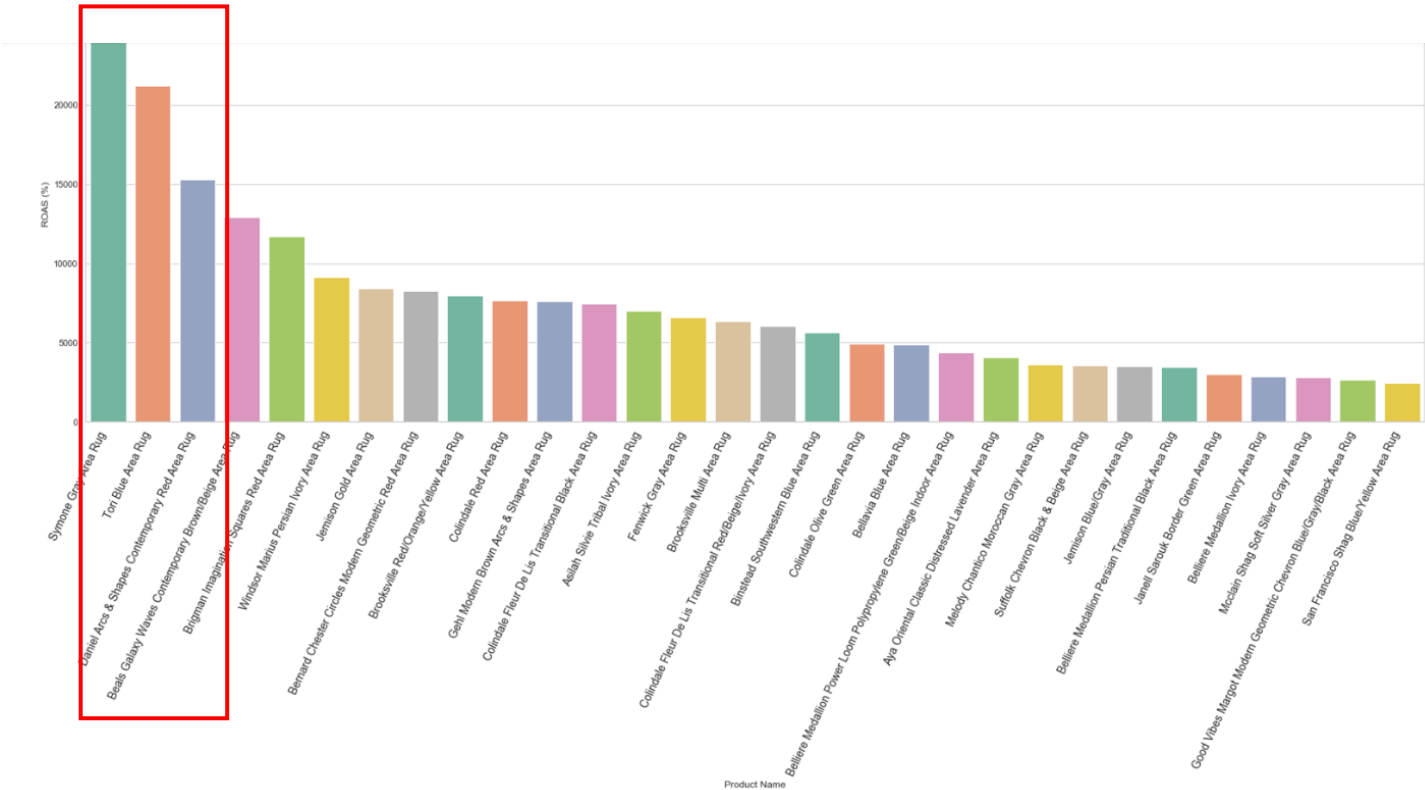
**Recommendation:**

Maybe for next campaign, we could invest more products that produced by Well Woven, Zipcode Design and test the products produced by Orren Ellis, Winston Porter and World Menagerie.

4.2.3 Product Name Analytics



# The total spending for each Product Name for difference campaign



# The top 30 total ROAS for each Product Name for difference campaign

Description:

These charts describe the different Product’s Total Spend and ROAS (%).

Question:

Which Products have good performance in the past campaigns?

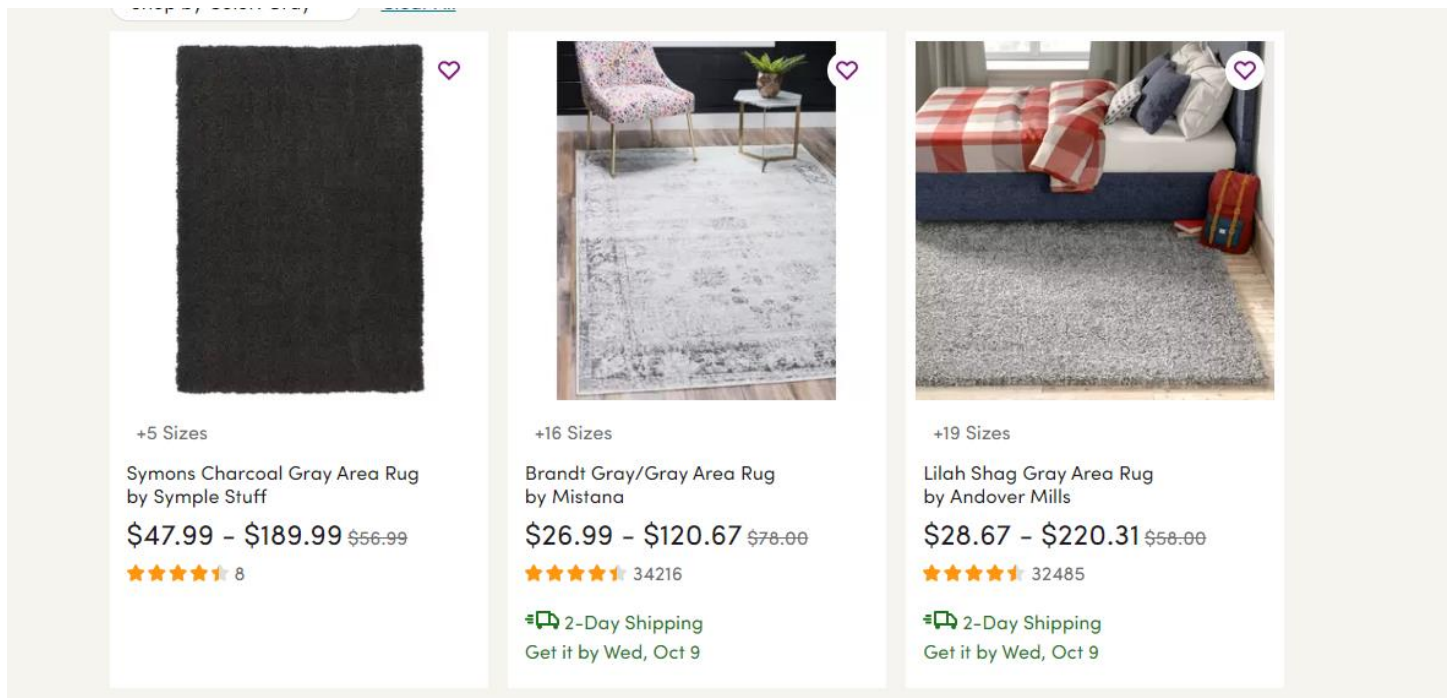
## Answer:

1. *Symone Gray Area Rug*
2. *Tori Blue Area Rug*
3. *Daniel Arcs & Shapes Contemporary Red Area Rug*

From the first chart, we could observe that we invest a lot different products in different campaigns. In the second chart, I filtered out the products have no ROAS in these campaigns. We could observe that only a few of them get return from the investment. Among these products which have the ROAS value, Symone Gray Area Rug, Tori Blue Area Rug and Daniel Arcs & Shapes Contemporary Red Area Rug have the highest return among these products.


## Recommendation:

Maybe for next campaign, we could invest more products which have the same attributes with Symone Gray Area Rug, Tori Blue Area Rug and Daniel Arcs & Shapes Contemporary Red Area Rug. For example, rugs which have colors like gray, blue and red, and rugs which belong to Symone, Tori and Daniel collection.



Symone Gray Area Rug

[https://www.wayfair.com/filters/keyword.php?keyword=symone+gray+area+rug&filters=colorList~Gray&new\\_keyword\\_search=1](https://www.wayfair.com/filters/keyword.php?keyword=symone+gray+area+rug&filters=colorList~Gray&new_keyword_search=1)




**Sale**


+6 Sizes

Tori Gray Area Rug  
by Winston Porter

**\$24.99 - \$259.99** ~~\$45.99~~

★★★★★ 183

 2-Day Shipping  
Get it by Wed, Oct 9




+6 Sizes

Tori Blue Area Rug  
by Winston Porter

**\$29.99 - \$279.99** ~~\$45.99~~

★★★★★ 182



+2 Sizes

Tori Handmade Dhurrie Wool/Cotton  
Gray Area Rug  
by Highland Dunes


**\$224.99 - \$489.99** ~~\$324.00~~

★★★★★ 1

FREE Shipping

## Tori Blue Area Rugs

[https://www.wayfair.com/keyword.php?keyword=Tori+Area+Rugs&command=dosearch&new\\_keyword\\_search=true&class\\_id=](https://www.wayfair.com/keyword.php?keyword=Tori+Area+Rugs&command=dosearch&new_keyword_search=true&class_id=)




+8 Sizes

Daniel Arcs & Shapes Contemporary  
Red Area Rug  
by Zipcode Design

**\$30.99 - \$289.99** ~~\$35.99~~

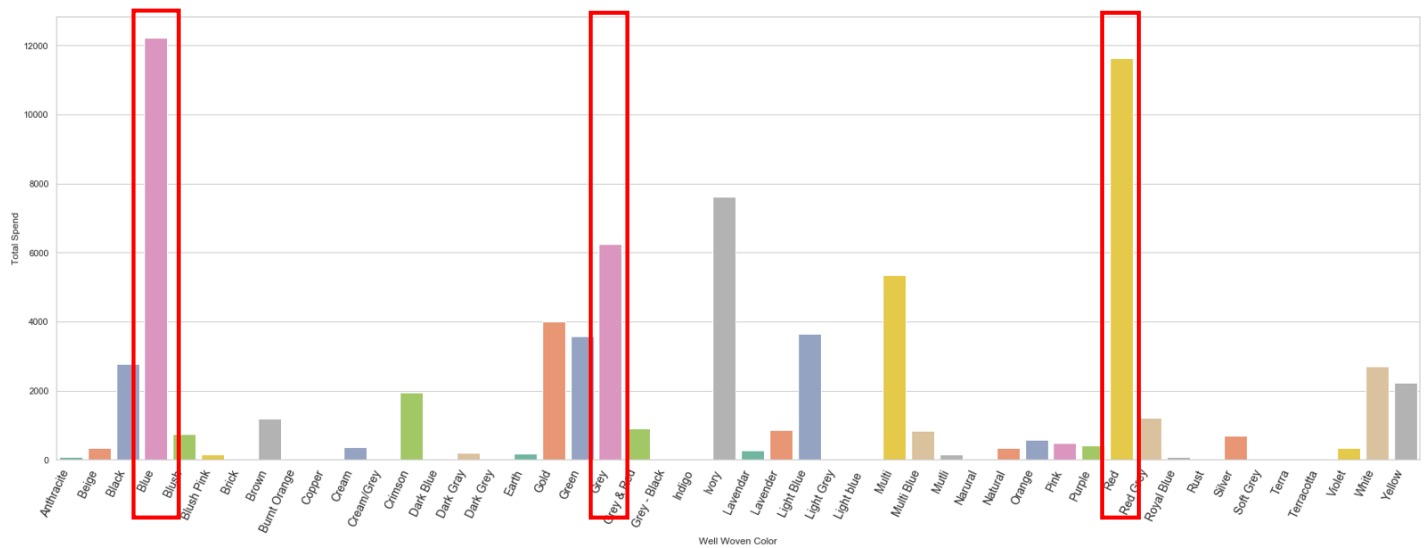
★★★★★ 3103

 2-Day Shipping  
Get it by Wed, Oct 9

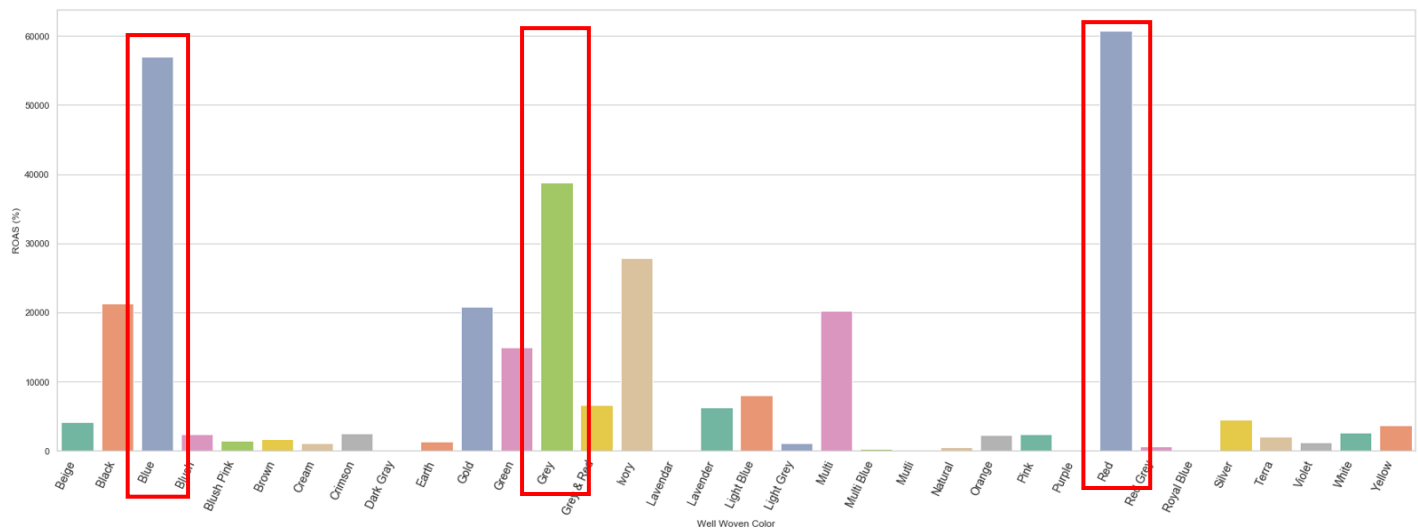
## Daniel Arcs & Shapes Contemporary Red Area Rug

[https://www.wayfair.com/filters/keyword.php?keyword=Daniel+Arcs+%26+Shapes+Contemporary+Red+Area+Rug&filters=colorList~Red&new\\_keyword\\_search=1](https://www.wayfair.com/filters/keyword.php?keyword=Daniel+Arcs+%26+Shapes+Contemporary+Red+Area+Rug&filters=colorList~Red&new_keyword_search=1)

#### 4.2.4 Color Analytics



# The total spending for each Color for difference campaign



# The ROAS for each Color for difference campaign

#### Description:

These charts describe the different Color's Total Spend and ROAS (%).

#### Question:


Which Colors have good performance in the past campaigns?

#### Answer:

1. Blue
2. Gray
3. Red

## Recommendation:

Still, we have the problems of lack of data and data imbalanced. In the second chart, I filtered out the colors have no ROAS in these four campaigns. Since we spent more money in Blue, Gray and red, we get more return from these two colors. But good news is that we spent money and will get return from them. For this reason, we could assume that customers may prefer the colors which are Blue, Gray and red. Maybe for next campaign, we could invest more products which have the colors which are Blue, Gray and Red. And test more color that we did not have history before like Copper, Dark Blue, Light Blue, Terra and Terracotta.



Sale


♡


+19 Sizes

Hosking Blue Area Rug  
by Laurel Foundry Modern Farmhouse

**\$24.71 - \$633.44**

★★★★★ 26055

 2-Day Shipping  
Get it by Fri, Oct 4




♡


+8 Sizes

Stuart Blue/Beige Area Rug  
by Zipcode Design

**\$23.99 - \$414.04** ~~\$233.00~~

★★★★★ 2869

 2-Day Shipping  
Get it by Fri, Oct 4



♡

+16 Sizes

Brandt Turquoise/Gray Area Rug  
by Mistana


**\$23.99 - \$167.77** ~~\$78.00~~

★★★★★ 31045

Blue

[https://www.wayfair.com/keyword.php?keyword=blue+area+rugs&command=dosearch&new\\_keyword\\_search=true&class\\_id=](https://www.wayfair.com/keyword.php?keyword=blue+area+rugs&command=dosearch&new_keyword_search=true&class_id=)





Quickview

+6 Sizes


[Delana Dark Blue/Teal/Light Gray Area Rug](#)  
by Beachcrest Home

**\$36.99 - \$349.99** ~~\$51.00~~

★★★★★ 288

🚚 2-Day Shipping  
Get it by Fri, Oct 4

Sale




+5 Sizes

Caviness Boxes Design Gray  
Geometric Area Rug  
by Brayden Studio

**\$46.99 - \$109.99**

★★★★★ 21



+17 Sizes

Brandt Light Blue/Ivory Area Rug  
by Mistana


**\$24.99 - \$103.58** ~~\$58.00~~

★★★★★ 33994

🚚 2-Day Shipping  
Get it by Fri, Oct 4

Gray

[https://www.wayfair.com/keyword.php?keyword=gray+area+rugs&command=dosearch&new\\_keyword\\_search=true&class\\_id=](https://www.wayfair.com/keyword.php?keyword=gray+area+rugs&command=dosearch&new_keyword_search=true&class_id=)



+8 Sizes


Shankle Brown Area Rug  
by Winston Porter

**\$35.99 - \$405.69** ~~\$109.05~~

★★★★★ 1215

🚚 2-Day Shipping  
Get it by Wed, Oct 9

Sale



+23 Sizes


Barrera Multicolor Area Rug  
by Bloomsbury Market

**\$42.99 - \$688.99** ~~\$49.35~~

★★★★★ 457

🚚 2-Day Shipping  
Get it by Wed, Oct 9

Sale



+8 Sizes

Jaidan Multicolor Area Rug  
by Bloomsbury Market

**\$29.99 - \$154.99** ~~\$58.00~~

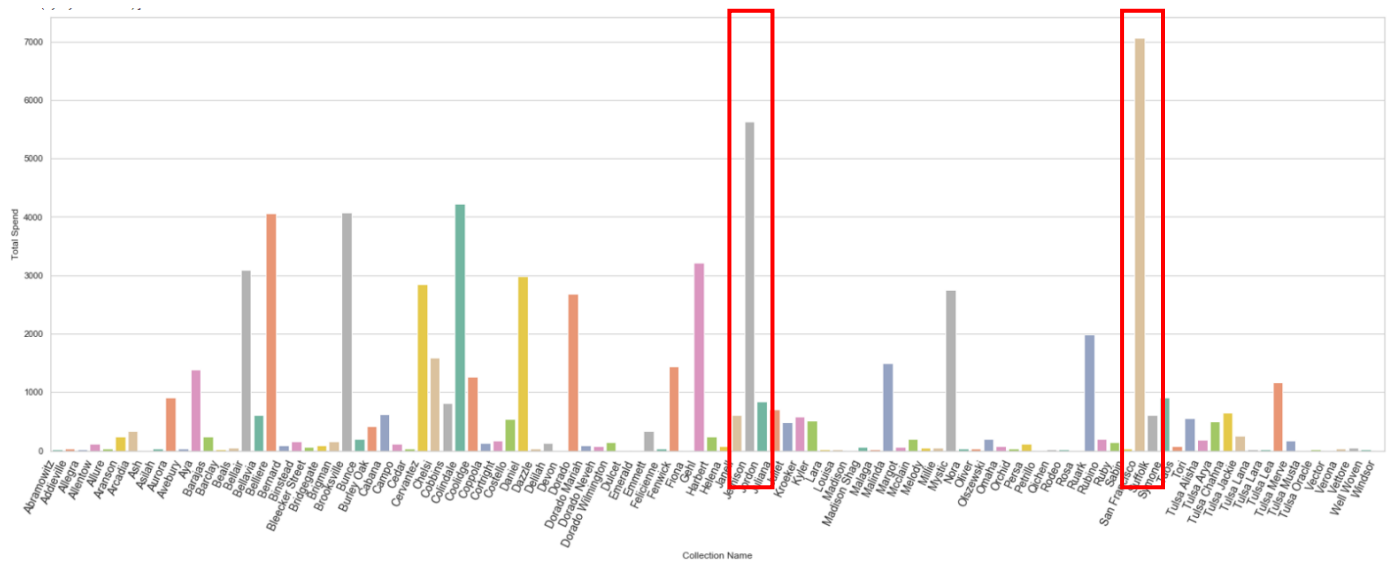
★★★★★ 282

Red

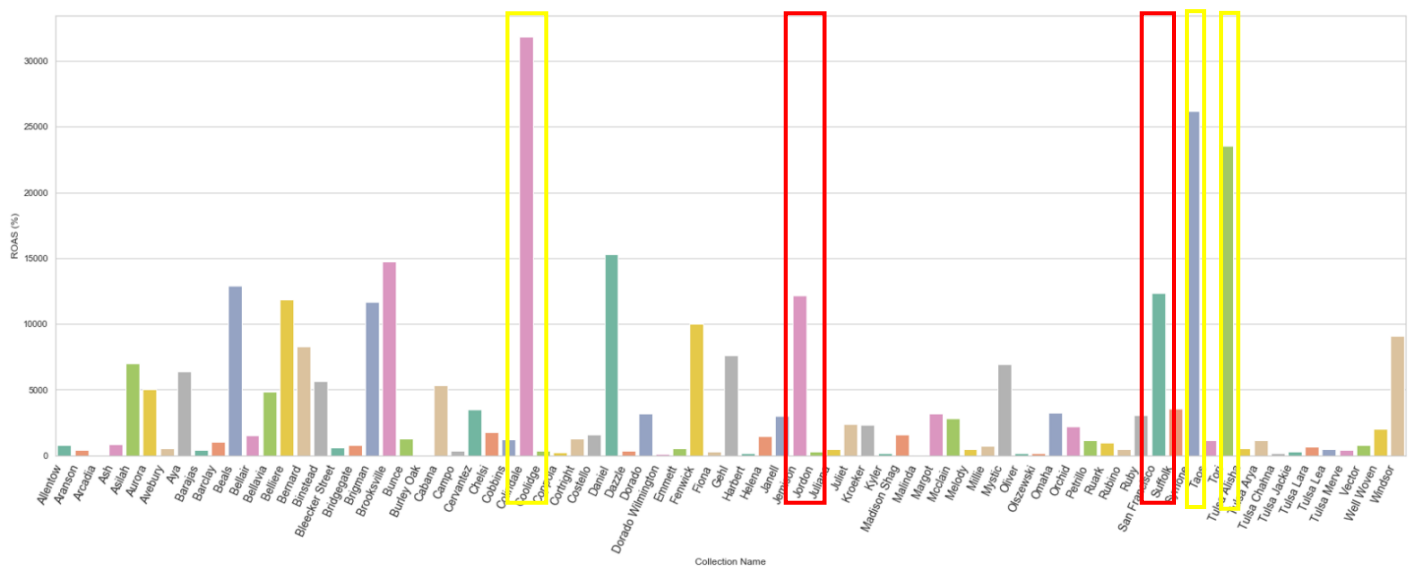
[https://www.wayfair.com/keyword.php?keyword=red+rugs&command=dosearch&new\\_keyword\\_search=true&class\\_id=](https://www.wayfair.com/keyword.php?keyword=red+rugs&command=dosearch&new_keyword_search=true&class_id=)



#### 4.2.5 Collection Analytics



### # The total spending for each Collection for difference campaign



### # The ROAS for each Collection for difference campaign

**Description:**

These charts describe the different Collection's Total Spend and ROAS (%).

**Question:**


### Which Collections have good performance in the past campaigns?

**Answer:**

1. Colindale
2. Symone
3. Tori

## Recommendation:

Still, we have the problems of lack of data and data imbalanced. In the second chart, I filtered out the collections have no ROAS in these four campaigns. From the red shape, we could observe that we invest a lot on the San Francisco and Jemison, but we the ROAS did not perform good in the past campaigns. From the yellow shapes, we could observe that we did not invest a lot on Colindale, Symone, Tori compare with San Francisco and Jemison, but we get a lot return from these collections. In the next campaign, it highly suggests that we could invest more products belong to Colindale, Symone and Tori and invest less on the San Francisco and Jemison.




Colindale Fleur De Lis Transitional Red/Beige/Ivory Area Rug by Astoria Grand

+9 Sizes

\$25.99 - \$409.99 ~~\$38.99~~

★★★★★ 529

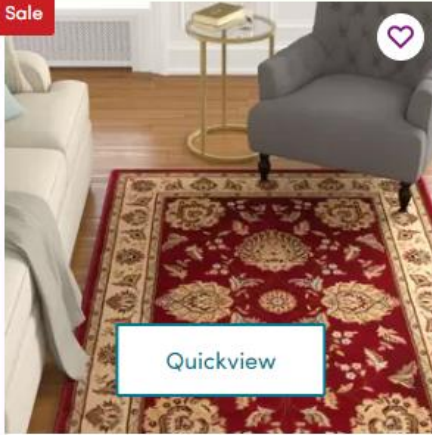


Colindale Olive Green Area Rug by Astoria Grand

+9 Sizes

\$25.99 - \$399.99 ~~\$38.99~~

★★★★★ 379



Colindale Red Area Rug by Astoria Grand


+9 Sizes

\$25.99 - \$439.99 ~~\$38.99~~

★★★★★ 292

Colindale

[https://www.wayfair.com/keyword.php?keyword=Colindale&command=dosearch&new\\_keyword\\_search=true&class\\_id=](https://www.wayfair.com/keyword.php?keyword=Colindale&command=dosearch&new_keyword_search=true&class_id=)




+5 Sizes

Symons Charcoal Gray Area Rug  
by Symple Stuff

**\$47.99 - \$189.99** ~~\$56.99~~

★★★★★ 8

🚚 2-Day Shipping  
Get it by Wed, Oct 9




+16 Sizes

Brandt Gray/Gray Area Rug  
by Mistana

**\$26.99 - \$120.67** ~~\$78.00~~

★★★★★ 34221

🚚 2-Day Shipping  
Get it by Wed, Oct 9



**Sale**

+24 Sizes

Kulpmont Hand-Braided Gray Area Rug  
by Wade Logan


**\$29.99 - \$501.99** ~~\$72.00~~

★★★★★ 6493

🚚 2-Day Shipping  
Get it by Wed, Oct 9

Symone

[https://www.wayfair.com/filters/keyword.php?keyword=symone+gray+area+rug&filters=colorList~Gray&new\\_keyword\\_search=1](https://www.wayfair.com/filters/keyword.php?keyword=symone+gray+area+rug&filters=colorList~Gray&new_keyword_search=1)



**Sale**

+6 Sizes


[Quickview](#)

Tori Gray Area Rug  
by Winston Porter

**\$24.99 - \$259.99** ~~\$45.99~~

★★★★★ 183

🚚 2-Day Shipping  
Get it by Wed, Oct 9




+6 Sizes

Tori Blue Area Rug  
by Winston Porter

**\$29.99 - \$279.99** ~~\$45.99~~

★★★★★ 182



+2 Sizes

Tori Handmade Dhurrie Wool/Cotton Gray Area Rug  
by Highland Dunes

**\$224.99 - \$489.99** ~~\$324.00~~

★★★★★ 1

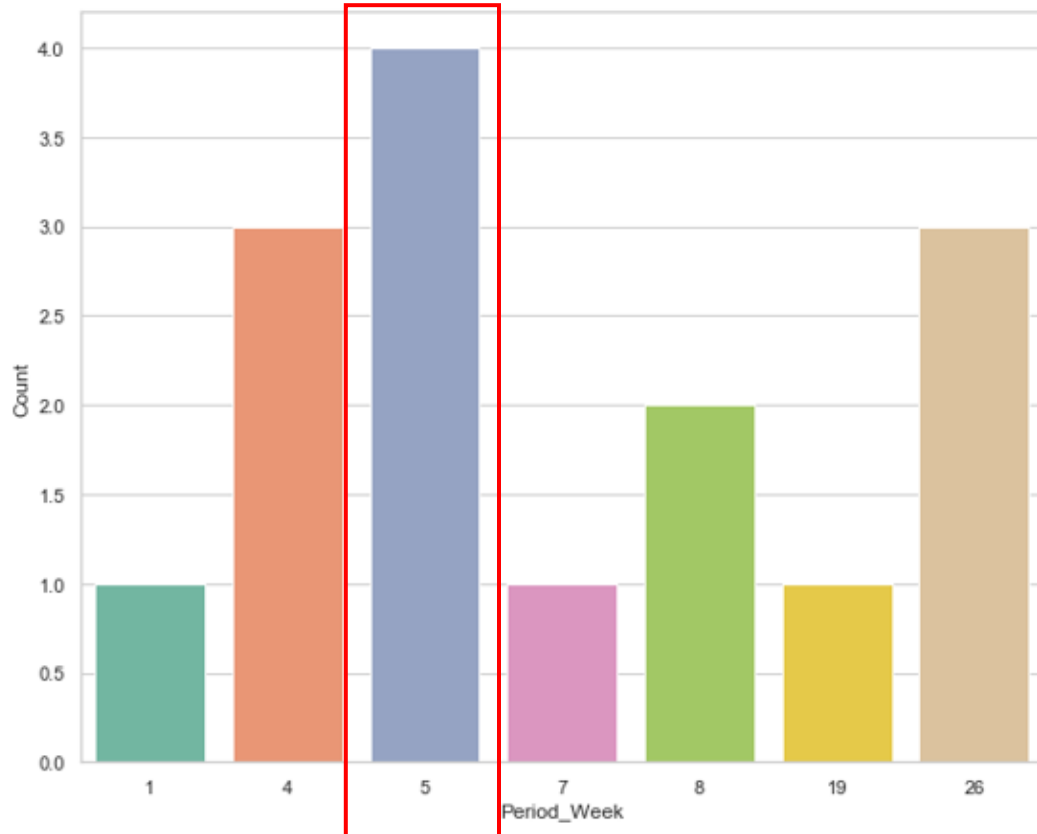
FREE Shipping

Tori:

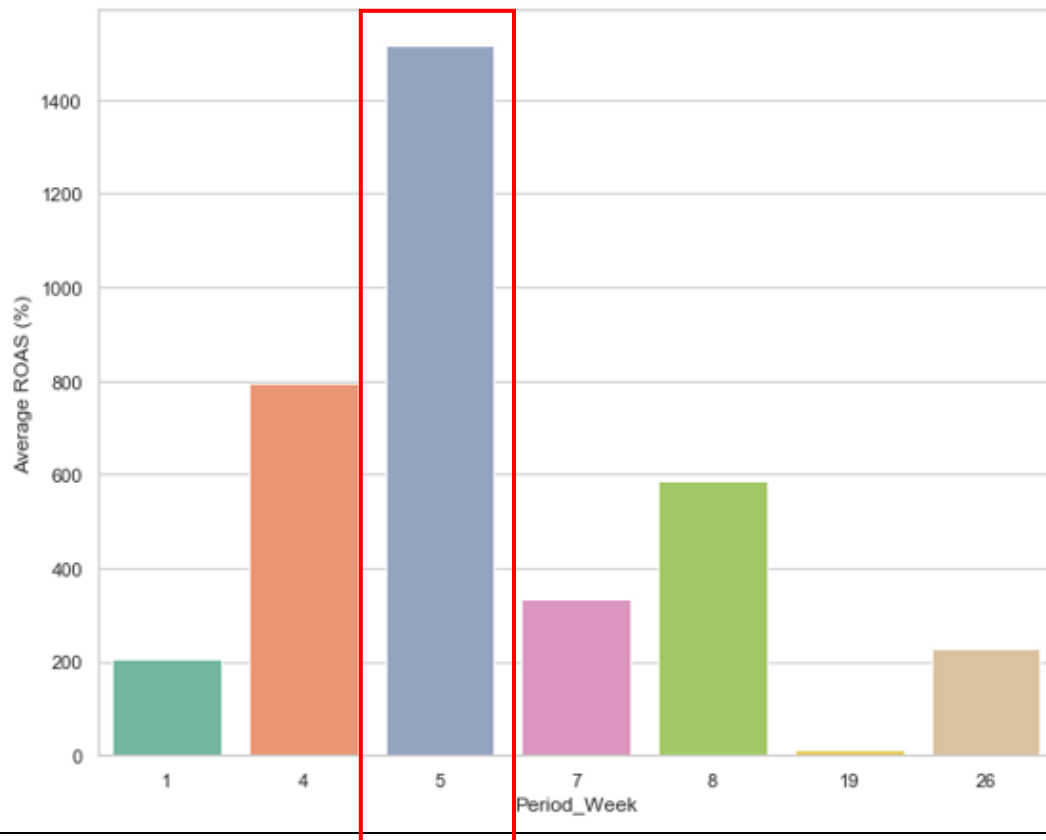
[https://www.wayfair.com/keyword.php?keyword=Tori+rug&command=dosearch&new\\_keyword\\_search=true&class\\_id=3](https://www.wayfair.com/keyword.php?keyword=Tori+rug&command=dosearch&new_keyword_search=true&class_id=3)

### 4.3 Date data analytics

#### 4.3.1 Campaign Period Analytics



# count of campaign in different period



# Average ROAS for different campaign period

**Description:**

These charts describe the average return for each campaign period and how many campaigns for each period.

**Question:**

How long should we run each campaign?

**Answer:**

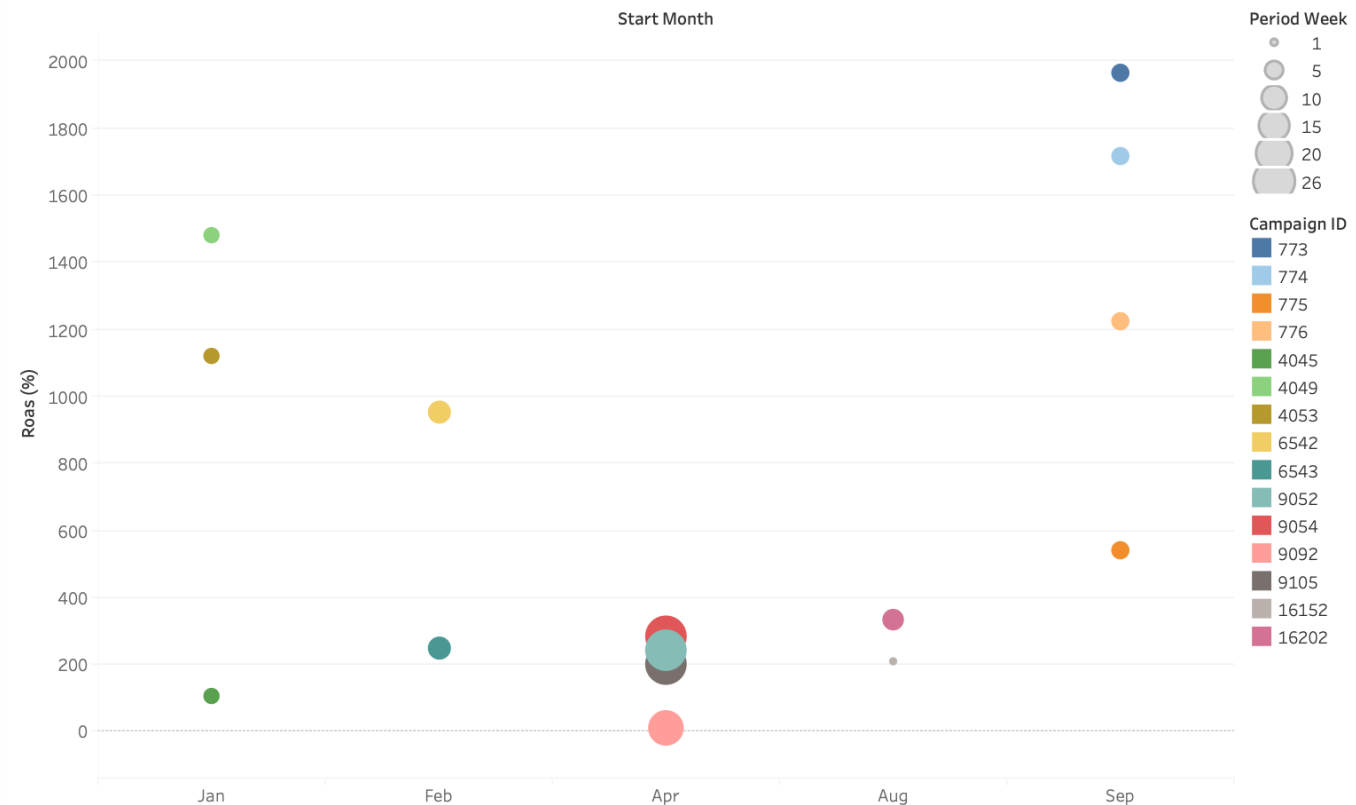
1. *5 weeks*

**Recommendation:**

From the first chart, we could observe that 5 weeks generate the highest ROAS compare with other average ROASs in different periods. And 26 week generates lowest ROAS compare with others. For next campaign, we could set the campaign period to 5 weeks instead for a long period like 26 weeks.

### 4.3.2 Campaign Date Analytics

#### Campaign Date Analytics



Sum of Roas (%) for each Start Month. Color shows details about Campaign ID. Size shows details about Period Week.

#### # campaign average return in different start date and period

##### Description:

This chart shows that the period and average ROAS for different campaign in different month.

##### Question:

Which month will get more return for campaigns?

##### Answer:

1. *September or cold season*

For this chart, we expect the size of the bubble is small and in the higher place which means that we get higher return in the short period of campaign. From the information this chart provided, in Jan, Feb and Sep, we did not run the campaign very long, but we get higher average ROAS than others campaign. In Apr, we run these campaigns so long and get lowest return.

##### Recommendation:

From the information provide by chart, I assume that people may prefer to buy rug in cold season instead of hot season like summer. We may run more campaign in the cold season and run less campaign in the hot season.



## 5. Limitation

This dataset only contained the information of 670 records and have a problem which is data imbalanced. For these two problems will cause we miss some important attributes maybe have great potential to boost the sales if we invest money on it. For example, we did not have the information of the color Brick, so we don't know that whether this color will have a good performance in return or not. Also, from the Numerical Data Analysis, we can't generate a strong conclusion that which CPC will have a highest ROAS.

## 6. Results

Assume that the data did not have the limitation, we could get a clear direction that what is a good CPC for campaigns and what kind of rugs maybe have a good ROAS in the new campaign.

- (1) Highly suggest CPC for next campaigns : 0.33, 0.36, 0.37 and 0.3

### [CPC Analytics](#)

- (2) From the Categorical Data Exploration, we could conclude that in next new campaign we could invest more rugs which are

1. belonging to classic and traditional style

### [Shop Classification Analytics](#)

2. produced by Well Woven, Zipcode Design. And in next new campaign, we could test some products produced by Orren Ellis, Winston Porter and World Menagerie.

### [Manufacture Analytics](#)

3. having colors like gray, blue and red and belong to Symone, Tori and Daniel collection

### [Product Name Analytics](#)

4. are Blue, Gray and Red. And test more color that we did not have history before like Copper, Dark Blue, Light Blue, Terra and Terracotta.

### [Color Analytics](#)

5. belonging to Colindale, Symone and Tori. And invest less on the San Francisco and Jemison.

### [Collection Analytics](#)

- (3) We could run the campaign around 5 weeks instead of long period [Campaign Period Analytics](#) and also it highly suggested that we could run more campaigns in cold seasons instead of hot seasons

### [Campaign Date Analytics](#).

## 7. Conclusion

In the future data analysis for Wayfair, we need to test more product with different kind of features. In order to better understand the preference from our customers in Wayfair. Also, if there are more datasets could be merged by the dataset come from the Wayfair Dashboard will assist us to find more insights for better supporting the future decision for new campaigns.