Marketing Mix Modeling of Kisloty 2014-2017

Mavis Sun
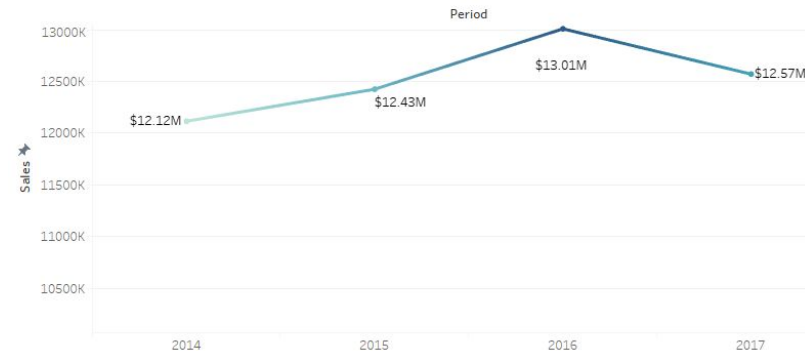January, 2021

Background

KISLOTY
stockholm, sweden
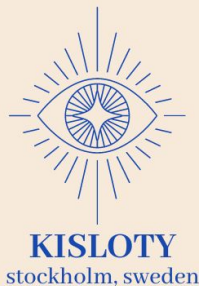
Kisloty is a fashion design brand launched in 2012, Stockholm.

Compared to 2016, **the marketing spend of Kisloty increased 1.9%** while **the total sales decreased 3.4%** in 2017, which is the first time decrease since 2014.

Through marketing mix modeling and iterative optimization, we can expect **a 4% lift in the sales in 2018 (back to the same level as 2016, 13m)** with the **similar budget in 2017**.
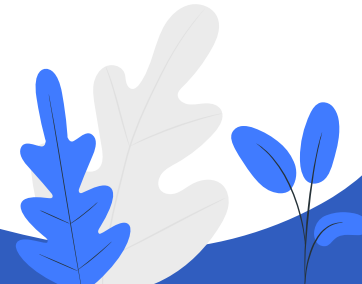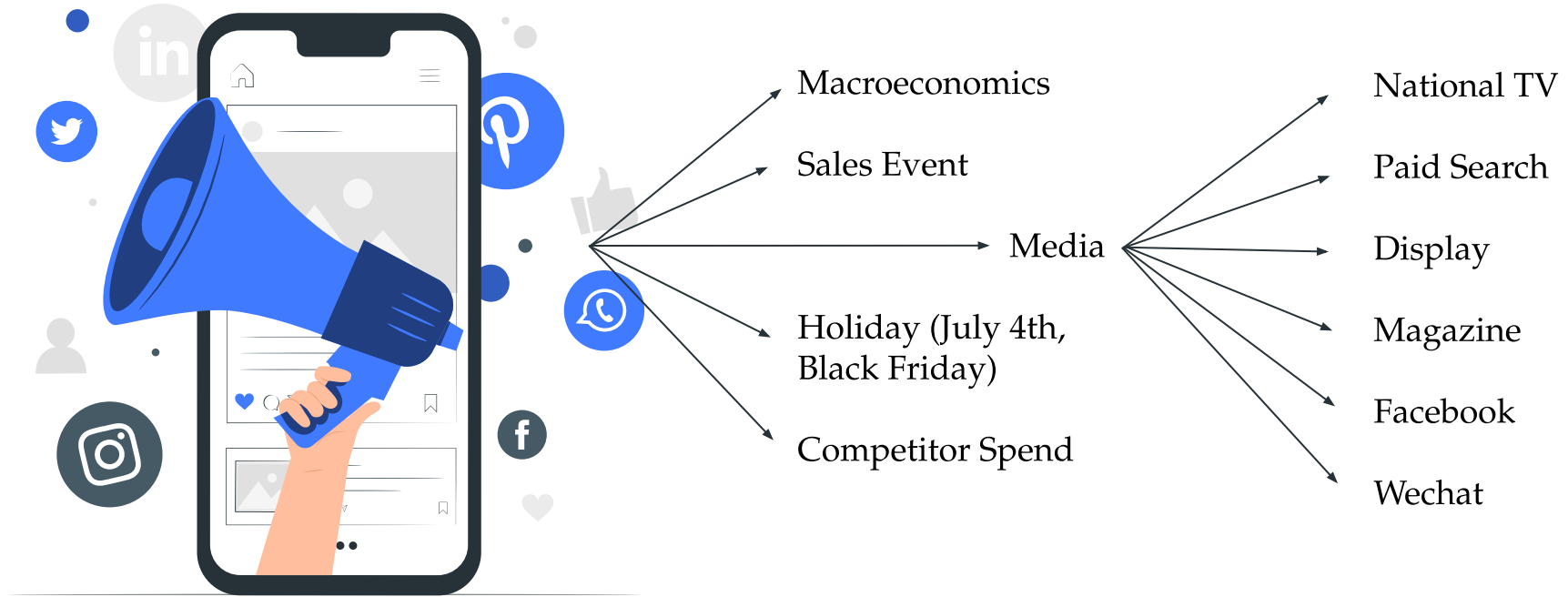
Sales Trend

Spend Trend

1 Model

Built based on the 2014-2017 historical data

Model Variables

Macroeconomics

Sales Event

Media

Holiday (July 4th, Black Friday)

Competitor Spend

National TV

Paid Search

Display

Magazine

Facebook

Wechat

Media Data Transformation

	Decay	Lag	Power (α)
National TV	0.8	1	0.6
Magazine	0.7	1	0.6
Paid Search	0.9	0	1
Display	1	0	1
Facebook	1	0	0.8
Wechat	0.9	1	1

Model Stats

	Coefficient	Std. Error	T Value	Pr(>|t|)	Sig Level
Intercept	1.523e+05	1.350e+04	11.282	< 2e-16	***
July 4th	1.195e+05	4.119e+03	29.019	< 2e-16	***
Black Friday	2.213e+05	4.867e+03	45.477	< 2e-16	***
CCI	2.497e+02	1.206e+02	2.070	0.0398	*
Sales Event	2.885e+04	1.637e+03	17.619	< 2e-16	***
Competitor Spend	-4.856e-01	8.076e-02	-6.013	8.77e-09	***
National TV	1.373e+03	3.329e+02	4.126	5.46e-05	***
Paid Search	5.402e-02	1.352e-02	3.996	9.10e-05	***
Wechat	5.019e+00	1.009e+00	4.976	1.42e-06	***
Magazine	1.735e+03	2.498e+02	6.946	5.42e-11	***
Display	2.739e-04	1.537e-04	1.782	0.0762	.
Facebook	1.028e-02	1.407e-03	7.304	6.87e-12	*

Y: Sales

X: July_4th, Black_Friday, CCI, Sales.Event, Comp.Media.Spend, NationalTV2, PaidSearch1, Wechat2, Magazine1, Display2, Facebook1

R Code:
model = lm(data = AF, Sales~July_4th + Black_Friday+CCI+Sales.Event+Comp.Media.Spend+NationalTV2+PaidSearch1+Wechat2+Magazine1+Display2+Facebook1)
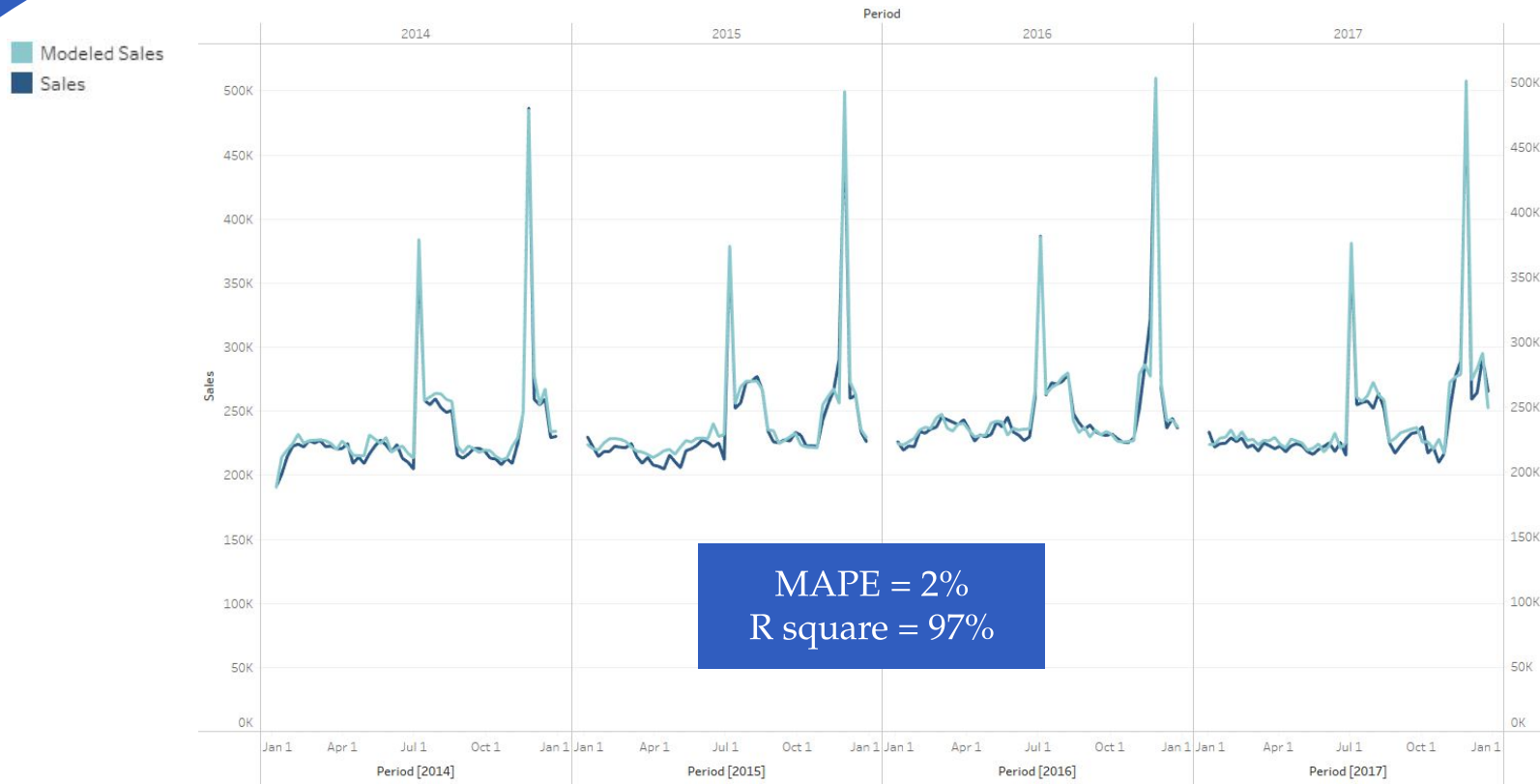
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
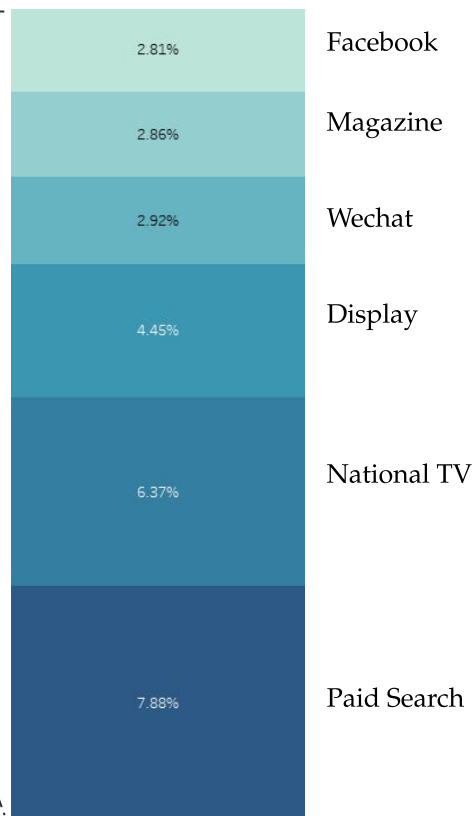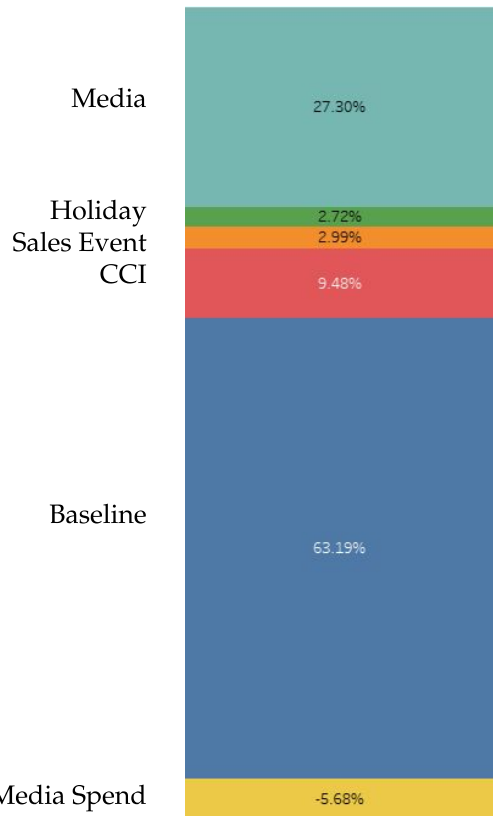
Residual standard error: 7674 on 196 degrees of freedom

Multiple R-squared: 0.9728, Adjusted R-squared: 0.9713

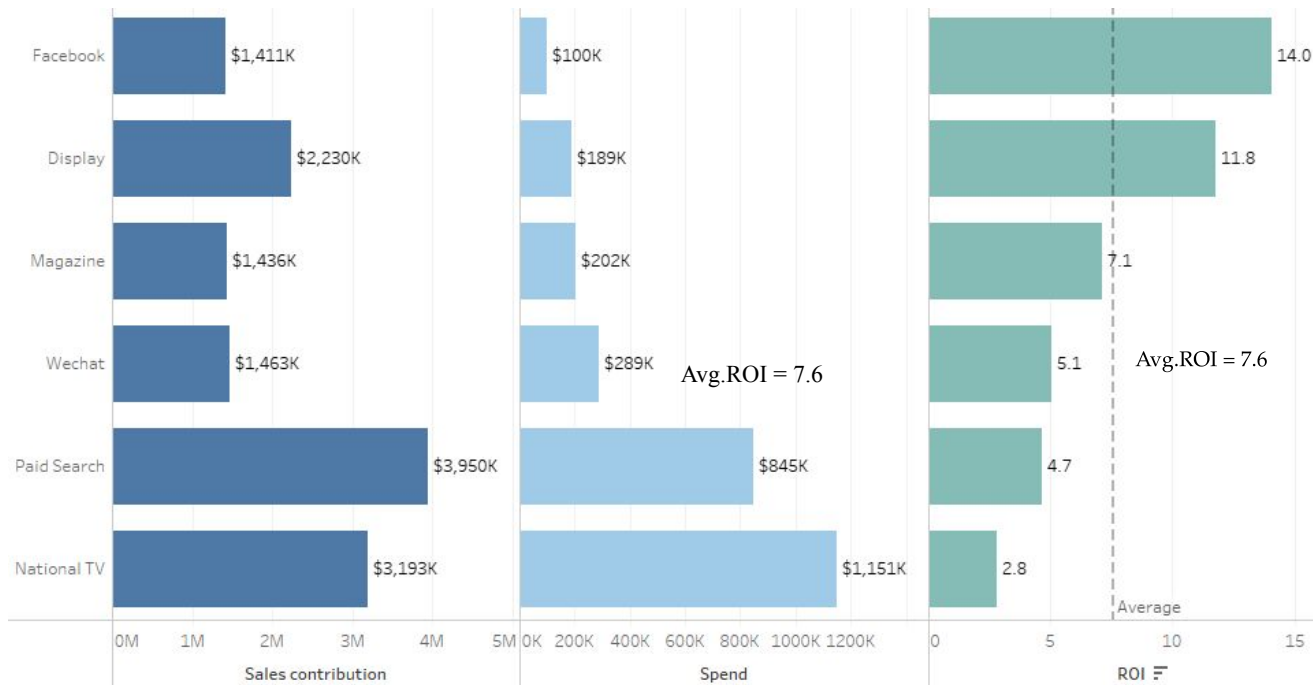F-statistic: 637.5 on 11 and 196 DF, p-value: < 2.2e-16

Model Fit Stats

MAPE = 2%
R square = 97%

Sales Revenue Contribution

Legend (left):
- Media
- Holiday
- Sales.Event
- CCI
- Baseline
- Comp.Media.Spend

Left chart labels and values:
- Media — 27.30%
- Holiday — 2.72%
- Sales Event — 2.99%
- CCI — 9.48%
- Baseline — 63.19%
- Competitor Media Spend — -5.68%

Legend (right):
- Facebook1
- Magazine1
- Wechat2
- Display2
- NationalTV2
- PaidSearch1

Right chart labels and values:
- Facebook — 2.81%
- Magazine — 2.86%
- Wechat — 2.92%
- Display — 4.45%
- National TV — 6.37%
- Paid Search — 7.88%

Media Channel Breakdown

Both **Facebook** and **Display** show excellent ROI, we can accordingly scale up budget on them in the future to further boost sales.
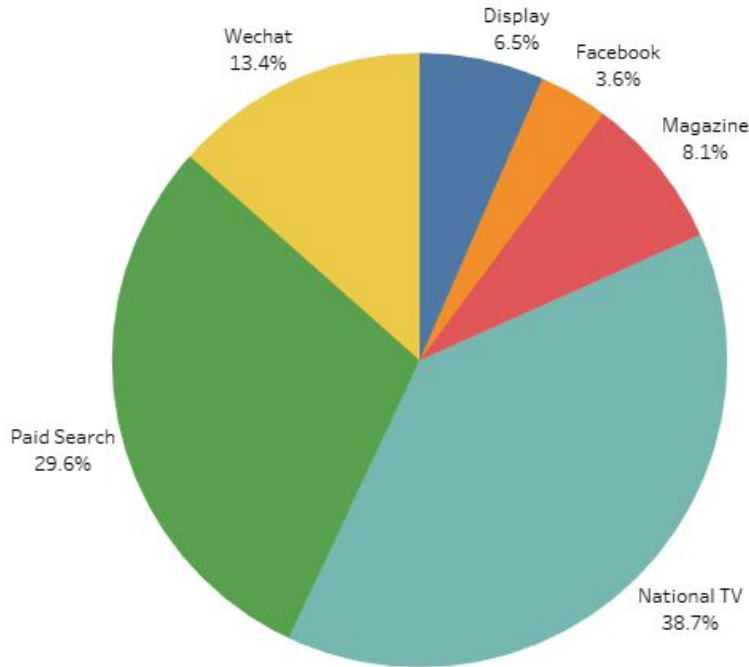
Side Diagnostic
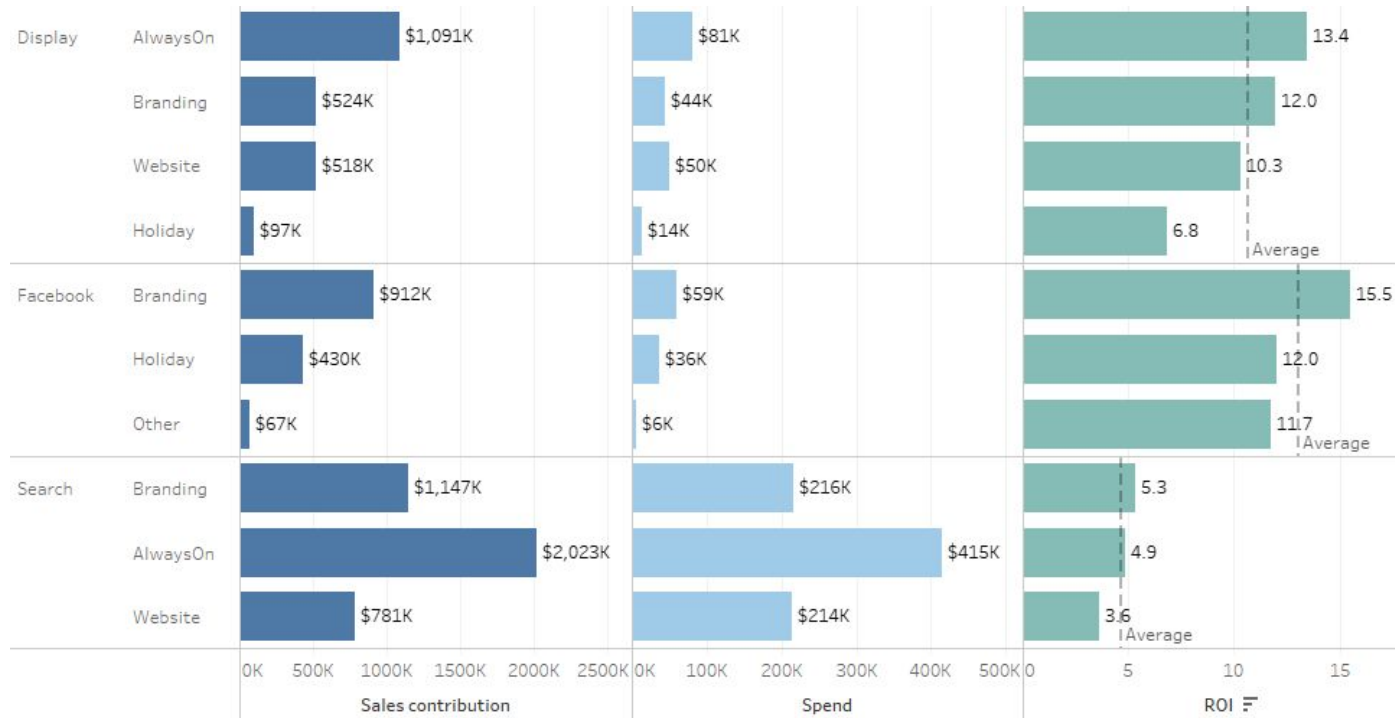
For all channels, **Always On** and **Branding** campaigns show higher ROI than the others.
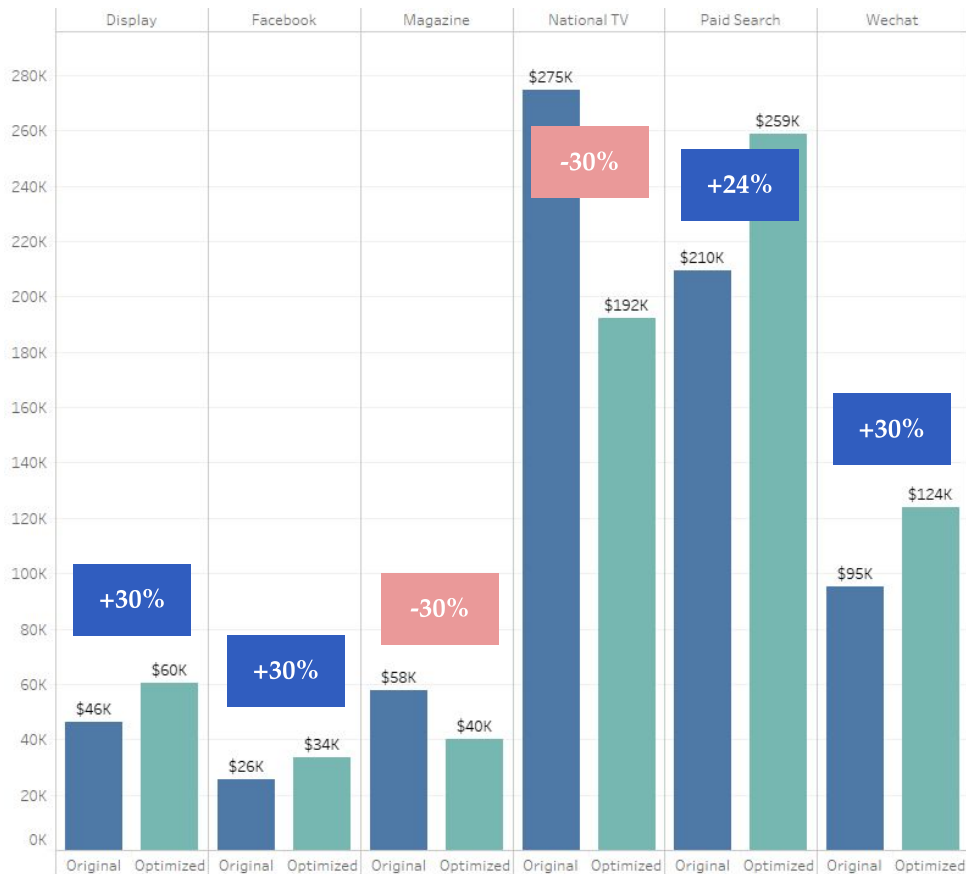
2018 Planned Media Spend

2018 Planned Media Spend: $709,132

*Both the Planned Media Spend and the Planned Spend Distribution in 2018 basically keep the same as in 2017.

With this budget plan, we can forecast 2018 performance by using the model we have:
- **Sales from Media**: $3,449,515
- **Media ROI**: 4.86
- **Total Sales**: $12,585,597 (still lower than 2016)

2018 Media Plan Optimization

Now we want to further optimize the 2018 performance through linear programming:

**Objective:** increase Sales from Media
Variable: Media Spend
Constraint:
- Total Media Spend (709k) keeps the same as the original plan
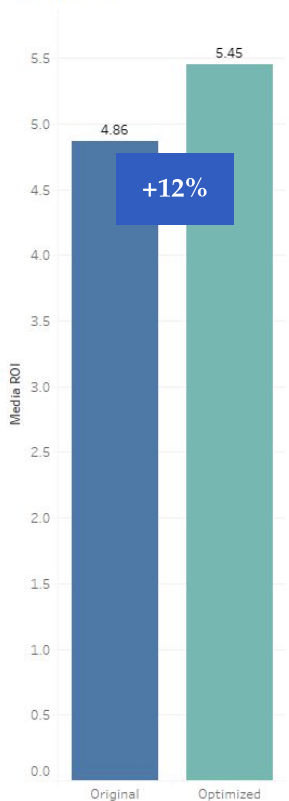- Each Media Spend fluctuates no more than 30%

According to the result from Excel Solver, to further increase Sales from Media, we recommend to **increase the budget for digital channels** while **decrease the budget for traditional channels**.
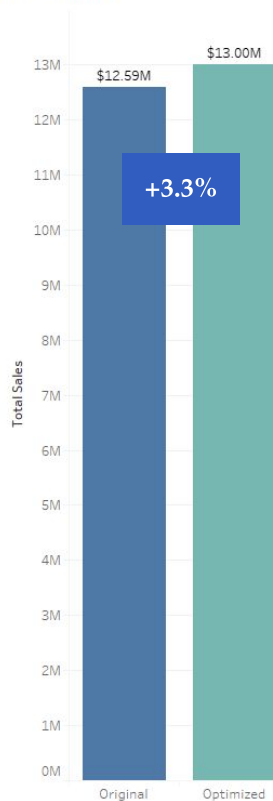
Expected Optimization Result

Media Sales
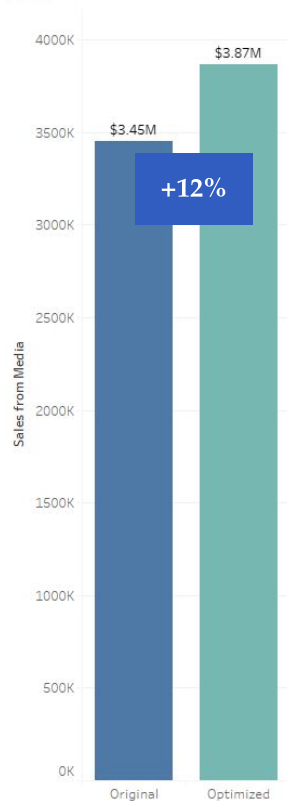
Media ROI

Total Sales

With the optimized media spend plan, we can expect **a 416k lift in sales**, which is reflected as a **12% lift on Media Sales**, a **12% lift on Media ROI**, a **3.3% lift on Total Sales** in 2018 compared to the original plan, Total Sales will be back to the same level as in 2016 (13m):

- **Sales from Media**: $3,865,811
- **Media ROI**: 5.45
- **Total Sales**: $13,001,894

Summary

According to the model built based on 2014-2017 data

We find:
- Facebook and Display have much higher ROI than other channels (Facebook: 14, Display: 11.8, Average: 7.6)
- Always On and Branding campaigns have higher ROI than other campaign types

We forecast:
- Without changing the total budget in 2018, accordingly increase budget for new media channels and decrease budget traditional media channels will lead to a 416k lift in sales, which is reflected as a 12% lift in Sales from Media, a 12% lift in Media ROI, a 4% lift in Total Sales, which brings Total Sales back to the same level as in 2016 (13 million)

Appendix

- Please find the complete result datasets **here**

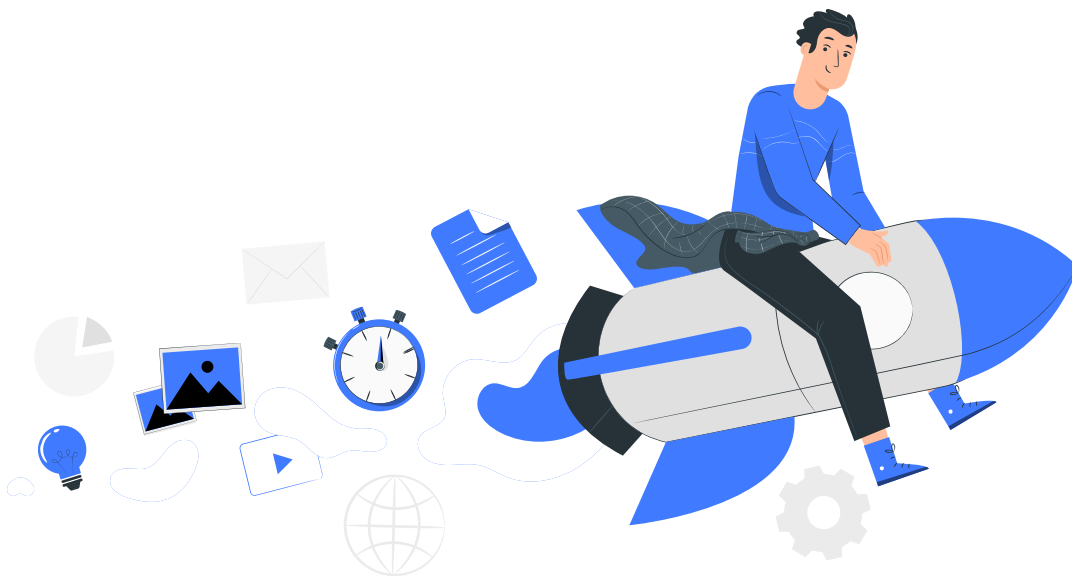- Please find the complete R script for this project **here**
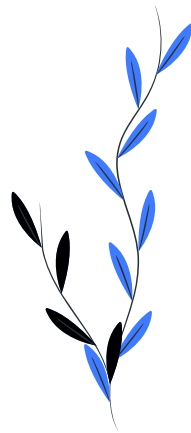
Thanks

Do you have any questions?

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