Business Success Analysis

Team 5

The Business Case

Air France Internet Marketing

-Optimizing Google, Yahoo!, MSN and Kayak Sponsored Search

- Because of the World Wide Web and the Emergence of E-Commerce, traditional travel industry was not suitable and need to transform. Sales model of airline has been changed.

- Consumer adoption of E-commerce for traveling is mainstream consumption. Air France cooperate with search engine, Google, Yahoo!, MSN, and Kayak. Thus, Keywords is important to enterprises especially while they have pay-per-click.

- Air France were pursuing an international growth strategy and were looking to increase their share in the hyper-competitive U.S. air travel market.

- We would give the plan after using R analysis data.
- For this business case we worked with the .xls provided which included :
  - 4150 observations
  - 23 variables
    - 11 character
    - 11 numerical

The Business problem

Motivation - Business Problem

How can we increase our media presence while keeping low costs?

We know here that there is a **high** positive correlation between the amount and clicks. And also a **high positive** correlation between total cost and clicks.

Method and Mechanics

Using coding in R to generate logistic regression :

1. Defining business success (1) as campaign with positive revenue
2. Defining business failure (0) as campaign with negative revenue

Then, applied logistic regression to:

1. Determine the relationship between variables

Logistic regression

```
##### Logistic regression #####
my_logit <- glm(Binary ~ Clicks_Norm+Impressions_Norm+EngineClickThru, data=airFrance_train, family="binomial")
summary(my_logit)
```

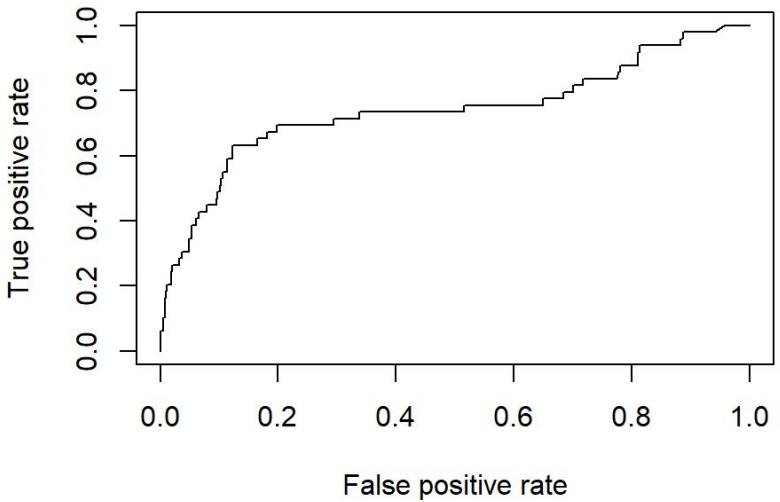
```
> summary(my_logit)

Call:
glm(formula = Binary ~ Clicks_Norm + Impressions_Norm + EngineClickThru,
    family = "binomial", data = airFrance_train)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-5.5894  -0.3553  -0.3516  -0.3354   2.5922

Coefficients:
                  Estimate Std. Error z value Pr(>|z|)
(Intercept)       -2.734351   0.083563 -32.722  < 2e-16 ***
Clicks_Norm       80.643958   7.886596  10.225  < 2e-16 ***
Impressions_Norm -22.960598   4.923478  -4.663 3.11e-06 ***
EngineClickThru   -0.008427   0.004657  -1.810   0.0704 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 1944.3  on 3607  degrees of freedom
Residual deviance: 1672.2  on 3604  degrees of freedom
AIC: 1680.2

Number of Fisher Scoring iterations: 7
```

Key Findings

- The result of logistic regression is same as expected 'Clicks' have the highest coefficient.
- Clicks have the most impact on increasing the revenue.
- Model has 0.9279 accuracy (very high).

ROC GRAPH & CONFUSION MATRIX

ROC Graph

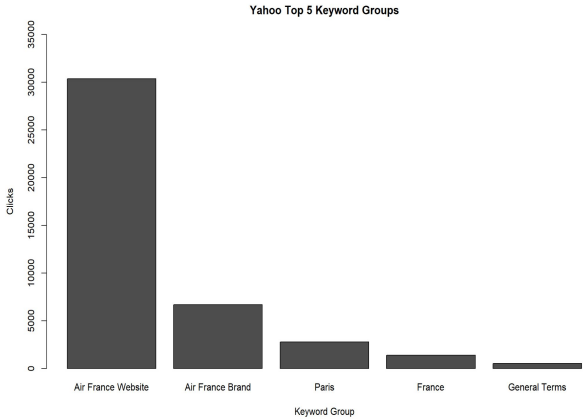


Confusion Matrix

```
Confusion Matrix and Statistics

          Reference
Prediction   0   1
         0 851  46
         1   2   3

               Accuracy : 0.9468
                 95% CI : (0.9301, 0.9605)
    No Information Rate : 0.9457
    P-Value [Acc > NIR] : 0.4794

                  Kappa : 0.1021

 Mcnemar's Test P-Value : 5.417e-10

            Sensitivity : 0.99766
            Specificity : 0.06122
         Pos Pred Value : 0.94872
         Neg Pred Value : 0.60000
             Prevalence : 0.94568
         Detection Rate : 0.94346
   Detection Prevalence : 0.99446
      Balanced Accuracy : 0.52944

       'Positive' Class : 0
```

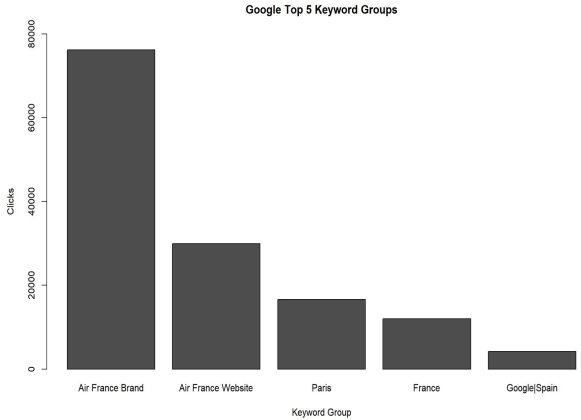
TOP KEYWORD GROUP

	KeywordGroup	x
2	Air France Website	30349
1	Air France Brand	6672
160	Paris	2785
102	France	1381
105	General Terms	518



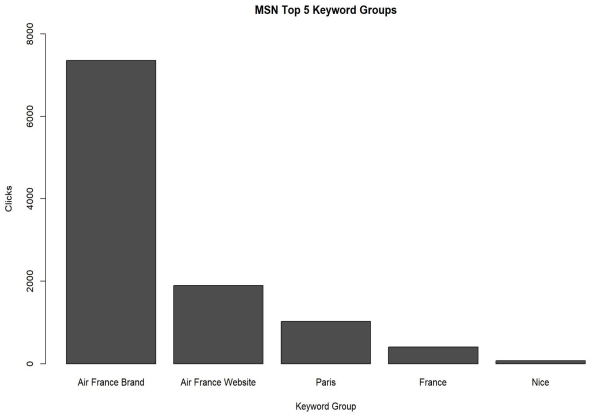
Yahoo!

	KeywordGroup	x
1	Air France Brand	76201
2	Air France Website	29966
211	Paris	16646
83	France	12001
138	Google|Spain	4194



Google

	KeywordGroup	x
1	Air France Brand	7359
2	Air France Website	1898
8	Paris	1026
4	France	406
7	Nice	73

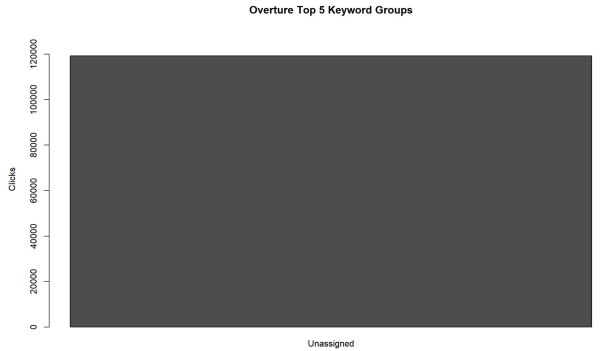


MSN

TOP KEYWORD GROUP

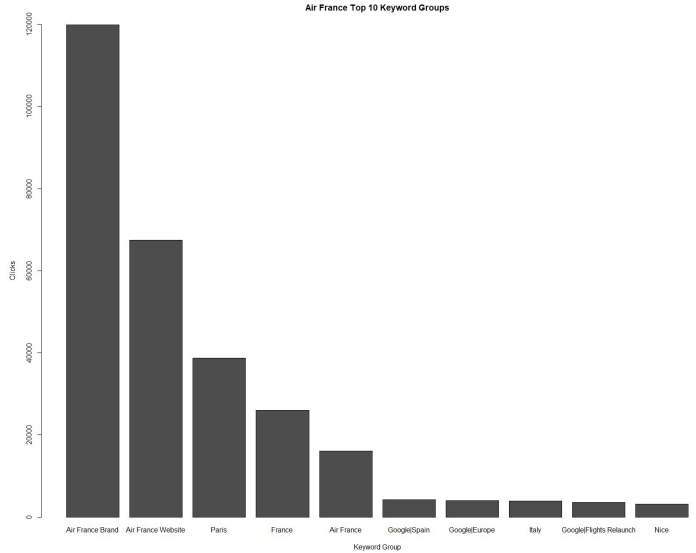
Overtures

	KeywordGroup	x
1	Unassigned	119323



Air France

	KeywordGroup	x
2	Air France Brand	119918
3	Air France Website	67499
302	Paris	38779
145	France	26006
1	Air France	16054
204	Google|Spain	4194
173	Google|Europe	4037
242	Italy	3910
174	Google|Flights Relaunch	3585
299	Nice	3183



The message

Analysis Process

- Summarize different dimension with different publisher.
- In same publisher but different area, all the number of clicks have positive relationship with their amount.
- Overall, the number of clicks cannot decide the amount.
- Yahoo! - US seems the most efficiently by the average cost per click and average total cost.

	Google_global_data	Google_US_data	MSN_G_data	MSN_U_data	Ove_G_data	Ove_U_data	Yahoo_U_data
Publisher	Google - Global	Google - US	MSN - Global	MSN - US	Overture - Global	Overture - US	Yahoo - US
Amount	929549.8	1745481.8	145524.25	181549.8	430084.7	347433.25	882288.95
Clicks	72895	192109	11217	10808	60899	119323	45598
Av. Cost(clicks)	2.22495942159669	2.38394176154635	2.15299820252525	2.86747007806122	0.80475884755877	0.76392055815053	1.99887565700787
Av. trans. conv	70.8964717015986	25.1168832715389	11.1658168604541	5.15771446520837	16.4686986268883	43.6606874223788	7.95657043407018

Summary & Results

- **Increase the clicks** in order to **increase revenue**
- Listed the campaign with the **most amount of clicks base on keyword groups** across each platform
- The **largest keyword groups** are **not** necessarily the ones **bringing the largest amount of money.**
    - For instance Keyword group “Bordeaux”, had 43 campaigns and brought a cost of 1446.7 to the company
- Found that the **top 5 keywords is almost the same on each platform**, except for Overtune where the keywords group is all unassigned

Recommendation

- Air France can increase interaction with Google-US and Yahoo!-US.
- Because of preference of people using keywords almost same in each publisher, Air France can synthesize the rest high-frequency keywords from different platforms.
- Since the keywords group are not directly determine amount, Air France should have more research and analysis in other parts that might influence the amount,

Thanks for listening!