Online & Offline Media ROI Measurement and Media Mix Optimization

Food brand

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Contents

1 Introduction: Marketing levers and modeling process

2 Project objectives and methodology.

Sales models

3 Key drivers of sales.

Online models

4 Key drivers of Google Paid Search, CTR and queries.

Media mix optimization

Optimization of advertising's contribution to sales.
Contents

1. **Introduction: Marketing levers and modeling process**
   Project objectives and methodology.

2. **Sales models**
   Key drivers of sales.

3. **Online models**
   Key drivers of Google Paid Search, CTR and queries.

4. **Media mix optimization**
   Optimization of advertisings contribution to sales.
Project objectives

Unilever wanted to identify the main marketing levers and measure the impact of online and offline media on sales of two products of a food brand.

Their key objective was to optimize media investment in order to maximize sales.
Sources of information

The analysis was carried out by Conento, with the support of BIG, between July and December 2014.

<table>
<thead>
<tr>
<th>VARIABLES BY CATEGORY</th>
<th>PERIODICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales by product</td>
<td>Monthly (sell-out) - Since 2011</td>
</tr>
<tr>
<td></td>
<td>Weekly (sell-in): Since Jul 2012*</td>
</tr>
<tr>
<td>Web traffic: Total and MicroSites</td>
<td>Weekly - Since July 2013</td>
</tr>
<tr>
<td>Media investment (online and offline)</td>
<td>Offline: Monthly – Since 2011</td>
</tr>
<tr>
<td></td>
<td>Online: Aggregated data since March 2013</td>
</tr>
<tr>
<td>Competitors’ Media investment</td>
<td>Monthly – Since 2011</td>
</tr>
<tr>
<td>Distribution, Price, Promotions* by product</td>
<td>Monthly – Since 2011</td>
</tr>
<tr>
<td>Queries</td>
<td>Quarterly – Since March 2011</td>
</tr>
<tr>
<td></td>
<td>Monthly – Since March 2013</td>
</tr>
<tr>
<td>Paid Search: Impressions / Clicks / Position / CTR by word group</td>
<td>Daily – Since March 2013</td>
</tr>
<tr>
<td>Display: Impressions / Clicks / CTR</td>
<td>Daily – Since December 2012</td>
</tr>
<tr>
<td>Macro-economic Variables: Unemployment Rate / consumer confidence index / GDP evolution</td>
<td>Yearly – Long historic</td>
</tr>
<tr>
<td>Socio-demographic data (population, Internet penetration, etc)</td>
<td>Yearly – Long historic</td>
</tr>
<tr>
<td>Temperature, Holidays etc.</td>
<td>Monthly – Since 2011</td>
</tr>
</tbody>
</table>

*Note: We only considered distributors data and the presence or absence of promotions, because we did not have any more data available.
Methodology

– We tested both linear and log-linear econometric models in order to find the best methodology. Finally, we chose linear models because, although the results of both analysis were quite similar, the interpretation of the coefficients of the variables is far more complex in the case of log-linear models.

– Using the linear methodology, we built the sales, Google Paid Search clicks and the brand queries models. In the case of the latter, we also used Loess time series decomposition in order to disaggregate the series into their trend, seasonal and remainder components.

– Using the learnings from the models and an optimization algorithm, we were able to recommend optimal levels of investment for TV, Paid Search and Display, in order to maximize their contribution to sales.
Econometric models help to quantify the ROI of offline and online media, measuring the impact of the main marketing and business levers.

* In this study data of awareness are not available.
We identified the main communication drivers for each step of the consumer purchase process.
Contents

1. Introduction: Marketing levers and modeling process
2. Project objectives and methodology.

Sales models
3. Key drivers of sales.

Online models

Media mix optimization
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The final sales models are very robust, with levels of fit to actual sales over 94%.

**Product A**

- Sales ('000 Kg)
- *R²: 99.3%

- References
  - Reference 1: 98.3%
  - Reference 2: 94.6%
  - Reference 3: 99.5%
  - Reference 4: 99.6%

**Product B**

- Sales ('000 Kg)
- *R²: 98.8%

- References
  - Reference 1: 94.7%
  - Reference 2: 95.9%
  - Reference 3: 94.5%
The models are capable of isolating the effect of each variable, in order to achieve the optimization of media investment.

**Product A sales - Key drivers**

- Growth levels: Possibly advertising + promotions extra effect
- Promotions make sales grow
- Weighted distribution creates the baseline of sales
- Media investment contributes to sales
- Sales are price sensitive: The higher the price per unit, the more sales decrease

**Contribution of variables**

- Weighted Selling Distribution: 60.9%
- Price: 24.0%
- Media Investment: 5.3%
- Promotions: 4.12%
- Rest of positive variables: 0.66%
- Rest of negative variables: 0.4%

*Note: Media investment explains 8.20% of real sales.*

**Product B sales - Key drivers**

- Possibly advertising + promotions extra effect
- Media investment contribution

**Contribution of variables**

- Weighted Selling Distribution: 55.1%
- Price: 41.9%
- Media Investment: 0.8%
- Promotions: 0.3%
- Rest of positive variables: 1.6%
- Rest of negative variables: 0.66%

*Note: Media investment explains 4.21% of real sales.*
Contents

1. Introduction: Marketing levers and modeling process
2. Project objectives and methodology.

Sales models
3. Key drivers of sales.

Online models

Media mix optimization
Optimization of advertisements contribution to sales.
Impressions and Average position are the main drivers of Google Paid Search clicks models.

**Product A clicks - Key drivers**
- Brand Queries have a positive effect on clicks.
- As average position rises, number of clicks decreases.

**Product B clicks - Key drivers**
- Brand Queries have a positive effect on clicks.
- The growing trend may be due to the internet penetration increase over time in Russia.
- As average position rises, number of clicks decrease.

**Contribution of variables**
- More than 90% of Product A clicks are explained by 3 main variables: Impressions, Average position and Brand queries.
- More than 80% of Product B clicks are explained by 3 main variables: Impressions, Average position and Brand queries.
Synergy between online and offline media.

In general, products with higher offline investment also have higher CTR.

Position increases clicks.

Increasing / decreasing average position increases / decreases clicks in a non linear way.

<table>
<thead>
<tr>
<th>Product A</th>
<th>Product B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average position</td>
<td>Average position</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1.3 *</td>
<td>1.4 *</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

In this case average position for Product A was 1.3. If average position had been constantly 1, total clicks should increase by 35.2%. If average position had been 2 (or constantly 2), total clicks should decrease by -29.9%.

*Note: Paid Search average position.
Offline advertising of the brand helps increase Queries (brand online interest), especially when new products are launched.

**Key drivers**

Brand Queries

- New references launch period
- New references launch period

**Contribution of variables**

- Advertising helps queries to rise
- In some periods, queries are lower than expected.
- 10.3% of Brand queries come from offline investment.
- 80.1% of Brand queries come from ...positive variables

See Queries explanation
Contents

1. Introduction: Marketing levers and modeling process
2. Project objectives and methodology.
3. Sales models
   Key drivers of sales.
4. Online models
   Key drivers of Google Paid Search, CTR and queries.
5. Media mix optimization
   Optimization of advertisings contribution to sales.
Based on their contribution to sales, it is possible to calculate the ROI for each media:

**Product A**

- **TV**: 3.63
- **Search**: 0.02
- **Display**: 0.14

TV contribution to sales is 3.63 thousand kilos in its total period (Mar 13 – Apr 14)

**Product B**

- **TV**: 9.33
- **Search**: 0.23
- **Display**: 0.49

TV contribution to sales is 9.33 thousand kilos in its total period (Oct 11 – Apr 14)

**% ROI**

- **Product A**
  - TV: 0.76%
  - Search: 0.57%
  - Display: 0.59%

For each million Rubles invested on TV, Product A sales rise 0.76% over average.

- **Product B**
  - TV: 1.04%
  - Search: 1.69%
  - Display: 0.86%
TV is the media with the highest contribution to sales. However, in the case of lower investments, Search and Display have bigger contributions.

**Note:** As online investment is low and the market is growing, we estimated the sales contribution of Search and Display for higher investments using Conento’s benchmark for these media (see dotted lines).
Optimizing media investment, Unilever should increase advertising contribution to Product A sales by 2.3%, and to Product B by 8.1%.

**Product A**
- Optimized investment: TV 93.6%, Search 0.4%, Display 5.9%
- Real investment: TV 96.4%, Search 0.3%, Display 3.3%
- Increased contribution due to advertising:
  - TV: +2.3%
  - Search: +0.1 pp
  - Display: +2.6 pp

**Product B**
- Optimized investment: TV 89.3%, Search 1.7%, Display 9.1%
- Real investment: TV 93.8%, Search 1.0%, Display 5.2%
- Increased contribution due to advertising:
  - TV: +8.1%
  - Search: +0.7 pp
  - Display: +3.9 pp

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See optimization methodology
If we optimized media investment between the 2 products, advertisings contribution to total sales should rise by 23.7%, as Product B sales response is higher.

Product A + Product B

Optimized investment distribution by scenario

Optimized vs. real investment

Increased contribution due to advertising
Summary of Main Learnings.

• **Main drivers of sales are Structural Variables**
The most important contributions to Product A and Product B sales are generated by structural variables (weighted distribution, price, and promotions) though **advertising** has a clear **extra effect on sales**.
The **total impact of media on short term sales** is 8.20% for Product A and 4.21% for Product B.

• **Both TV advertising and a better position in Paid Search increase clicks**
Products that have TV investment, have a higher CTR than those that don’t.

• **TV Advertising has a positive impact on Brand Queries**
10.3% of Brand queries are due to **TV advertising**. Queries also have a significant **impact on clicks**: they account for 17.0% of Product A clicks and 6.6% of Product B clicks.

• **Increasing Online investment will increase sales**
Currently TV is the media that has the highest contribution to sales due to its higher share of investment. **There is an opportunity to increase sales through higher investment in Search and Display.**

• **There are opportunities to optimize media investment in Product A and Product B and increase sales**
If we maintain the **average levels of investment in Product A and Product B** and optimize media mix (decreasing TV and increasing search and display investment), then **advertisings contribution to sales could improve by 2.3% and 8.1% respectively** (and 23.7% with a global optimization of investment between the 2 products).
A web user:

1. Enters in www.google.ru

2. In the Google Query String makes a search:
   - Brand
   - Non-brand

3. Clicks the impression related to the brand (in the Paid Search Area - SEM) and goes to its webpage.

We explain these clicks.
How do we consider the brand queries?

Brand Queries
(related to the brand)

keywords:

- Brand name
- Misspelled Brand name
- Brand web page
- Brand + other words
- ...

• When working with Brand queries we added up all keywords with representative volume regarding the brand, as showed above.

• The main difficulty was that we had quarterly data until March 2013. For the rest of the period we had monthly data.
How do we do the optimization to allocate spending by media?

Input:
Once we have defined the data set, parameters, variables and initial restrictions in the optimization software, we set the budget to optimize.

Total monthly Budget (in RB)

Optimization:
With a non linear algorithm, we try to get the highest contribution to sales using the calculated curves.

Effectiveness response curves

Output:
We obtain the budget share by media that guarantees the highest response for sales for the given budget.

Monthly optimal investment by media (in RB)