Practitioners’ Workshop, October 2015: Promotional Modelling and Forecasting

Selected slides from a Practitioners’ Workshop held in London, October 2015 – including presentations by forecasting specialists at SAS and Nielsen

Lancaster Centre for Forecasting, UK
MANAGING THE MARKETING MIX

James Oates
6th October 2015
MAXIMISING MEDIA AND PROMOTIONAL INVESTMENTS

An evolving challenge – evolving Nielsen approaches

The challenge of promotional and media investment

Measuring price and promotional activity effectively in the context of the full marketing mix

Meeting the challenge of an increasingly complex media landscape

Driving granular precision measurement to aid investment
Back to the Future...
GETTING FORECASTS RIGHT – IT’S INCREASINGLY COMPLEX

**Speed of change**
- Markets are different and demand questions are increasingly fast paced, quickly changing environment.

**Longer term vs short term business decisions**
- Address the need to prepare key business decisions, and allocate budgets and investments strategically
- These decisions may involve longer term investments such as production capabilities that won’t pay back in the short term

**Opportunity and risk assessment**
- Investing in areas that promise significant growth
- Set up activation plans to mitigate risks from flat or declining segments
% OF ALL SPEND WITH AN OFFER PEAKED IN 2011, BUT REMAINS HIGHER THAN BEFORE THE 2008 RECESSION

% of Spend on Offer – Total Food and Drink

Source: Nielsen Homescan Total GB 52w/e periods to 3rd January 2015
Value Sales bought on offer as % Total Food and Drink Value Sales  NB: Non trip projected data prior to 2011
UK PROMOTIONAL RELIANCE IN KEY CATEGORIES
NO RETAILER REALLY WANTS TO/CAN TAKE THE PRESSURE OFF BRANDS

Source: Nielsen Homescan – Total FMCG Grocery Multiples
52 w/e 26th April 2014 vs 52 w/e 27th April 2013
EVALUATING THE MARKETING MIX IS AT THE HEART OF GETTING FORECASTS BASED ON HISTORY RIGHT

Tension between sales and marketing functions

Market Mix provides the basis for evaluating above and below the line
GETTING BEHIND THE BUSINESS DRIVERS ABOVE AND BELOW THE LINE

Sales Drivers (Vol Ltrs), National

**2013**
- Pricing: Contribution to growth -56%
- Base: Contribution to growth -1%
- Competitor downsize: 5%
- Competitor Marketing: 9%
- Seasonality +Weather: 11%
- Media: 19%
- Distribution+ No. of Lines: 33%
- Promotions: 80%
- Total: 412.0m

**2014**
- Value: 451.8m

**2014 vs 2013**
- +10%
- 451.8m
- 31.9m
- Distribution+
- No. of Lines: 13.2m
- Media: 7.4m
- Seasonality +Weather: 4.6m
- Competitor Marketing: 3.5m
- Competitor downsize: 2.0m
- Base: -0.4m
- Pricing: -22.3m

**Key observations**
- Shelf price increased by more than 10% in second half of the year.
- Consumers have switched to changed pack size.
- Warmer summer & winter in 2014 benefitted from reduced media spend & more efficient media strategy.
- Increased media spend.
- Mainly driven by distribution rise mainly in impulse.
- Consumers have switched to changed pack size.
- Consumers have switched to changed pack size.

**ACTION:** Continue to invest in Media & support in-store to continue driving growth.
MODELS NEED TO DEVELOP TO CAPTURE THE COMPLEXITY WE ALL FACE DAY TO DAY

Media Touchpoints

- CAMPAIGN
- SOCIAL MEDIA
- SEARCH
- WEBSITE
- DIGITAL

- ONLINE
- PRINT
- MOBILE
- E-MAIL
- RADIO
- OOH
- TV
- TABLET

- ECOMMERCE PURCHASE
- IN-STORE PURCHASE

- DISCOUNTS
- FREE GIFT
- MULTIBUY
- PRICE
- DISPLAY
NIELSEN HAS DEVELOPED A TWO STAGE APPROACH TO MEASURE THE IMPACT OF TRADE INVESTMENTS VS MEDIA EFFECTIVELY
In-store Activity is Overwhelming – multiple offers
Measuring all marketing at the point of influence increases accuracy, granularity and feasibility of measurement
Why do we work at store level?
It is not only about distinguishing between total sales/price and base sales/price but avoiding Aggregation Bias

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Store 1</strong></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>$4.00</td>
</tr>
<tr>
<td>Sales</td>
<td>100</td>
</tr>
<tr>
<td><strong>Store 2</strong></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>$5.00</td>
</tr>
<tr>
<td>Sales</td>
<td>90</td>
</tr>
<tr>
<td><strong>Market Level Aggregate</strong></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>$4.47</td>
</tr>
<tr>
<td>Sales</td>
<td>190</td>
</tr>
</tbody>
</table>

**Example 1: Masked Variation**

- **Price Change at the store level**
- **No Price Change at the market level**

- In this example, aggregated data suggests that price is unchanged between week one and week two.
- However, sales changed in both stores as a result of price changes.
- A model based on disaggregated data would support robust price elasticity work.
Regular Price Structure Optimized
- Aligned with Business Strategy
- Cross interactions taken into account

We keep a low entry price to MyBrandA
We want the consumer to switch to 500gr

Opportunity for MyBrandB

Volume +13.2%
Value +7.1%
Profit +2.5%
Promotional Strategy — Incremental Sales

Promotional Activity Impact

- How to make my Portfolio and the Category Grow
- Be aware and careful of cannibalization

Portfolio Impact vs Category Impact

Promotion Activities vs Impacts per Store-week

- High Priority Investment: Share increase but won’t make your customer happy. Consider only the high Portfolio impact
- Discard
Promotional Strategy — Incremental Sales

Promotional Activity Impact
- How to make my Portfolio and the Category Grow
- Be aware and careful of cannibalization

Focus on High profitable activities
Promotional Strategy — Incremental Sales

Promotional Activity Impact
- How to make my Portfolio and the Category Grow
- Be aware and careful of cannibalization

![Graph showing the impact of promotional activities on portfolio and category sales](image-url)
Promotional Strategy — Incremental Sales

Promotional Activity Impact

- How to make my Portfolio and the Category Grow
- Be aware and careful of cannibalization

<table>
<thead>
<tr>
<th>Item</th>
<th>Promotion</th>
<th>Portfolio Impact</th>
<th>Category Impact</th>
<th>Profit Per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>MyBrandA_m</td>
<td>40% Disc.</td>
<td>-18.5%</td>
<td>+0.0%</td>
<td>-$77,253</td>
</tr>
<tr>
<td>MyBrandC_s</td>
<td>Display</td>
<td>-12.3%</td>
<td>+0.1%</td>
<td>-$32,505</td>
</tr>
<tr>
<td>MyBrandA_b</td>
<td>Event</td>
<td>-5.2%</td>
<td>-0.2%</td>
<td>-$24,119</td>
</tr>
<tr>
<td>MyBrandB_m</td>
<td>35% Disc.</td>
<td>-5.1%</td>
<td>-0.0%</td>
<td>-$4,275</td>
</tr>
<tr>
<td>MyBrandB_s</td>
<td>Multipack</td>
<td>-4.6%</td>
<td>+0.2%</td>
<td>-$18,734</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Promotion</th>
<th>Portfolio Impact</th>
<th>Category Impact</th>
<th>Profit Per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio</td>
<td>Event</td>
<td>+92%</td>
<td>+1.3%</td>
<td>+$98,355</td>
</tr>
<tr>
<td>MyBrandA_s</td>
<td>BOGOF</td>
<td>+87%</td>
<td>+1.2%</td>
<td>+$94,918</td>
</tr>
<tr>
<td>MyBrandB_m</td>
<td>20% Free</td>
<td>+53%</td>
<td>+0.4%</td>
<td>+$91,265</td>
</tr>
<tr>
<td>MyBrandA_s2</td>
<td>BOGOF</td>
<td>+52%</td>
<td>+0.8%</td>
<td>+$87,772</td>
</tr>
<tr>
<td>MyBrandB_m</td>
<td>20% Disc.</td>
<td>+36%</td>
<td>+0.1%</td>
<td>+$72,984</td>
</tr>
</tbody>
</table>
STEP 2: ANALYZE AT THE AGGREGATE LEVEL TO MEASURE ABOVE-THE-LINE MARKETING

**Dependent Variable**
- Aggregate Volume Trends

**Independent Variables**
- **Synergies**
- **Above-the-Line (TV, Print, Radio, OOH, Interactive/Online)**
- **Other Factors (Distribution, Competition, Economic Factors, Seasonality)**

**Econometric Multi-Variate Regression Model**

**STEP 1 OUTPUTS**

**Marketing Mix**

Depict the business drivers in relation to marketing effects, competitive impacts, & new product introductions in order to gauge building blocks & driving factors.
UNLOCKING THE VALUE OF MEDIA THROUGH OPTIMISATION
Measurement challenge

- Better inputs to improve confidence in business decisions
- New approaches to drive learning
- Getting more granular – people and store level
DIGITAL MEDIA CONSORTIUM
A DRIVE TOWARD INDUSTRY BEST PRACTICE

Publishers

Advertisers

Marketing Effectiveness Analysis

- Google Paid Search
- Facebook
- Synthetic Data Tests
- Catalina Network Analysis
- Fit and Holdout Assessment

- store level
- 132 MMMs
- 14 brands
- network analysis

Test Varieties

<table>
<thead>
<tr>
<th>Test</th>
<th>Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geography</td>
<td>National, DMA</td>
</tr>
<tr>
<td>Platform</td>
<td>Desktop, Mobile, Tablet, Combined</td>
</tr>
<tr>
<td>Gender</td>
<td>Female, Male, Combined</td>
</tr>
<tr>
<td>Metric</td>
<td>Impressions, Reach, Clicks, Ad Position</td>
</tr>
</tbody>
</table>

Outcomes

Accuracy
- Proven Metrics
- Thresholds for campaign design

Methodology
- Reach and Frequency
- Measurement of direct + indirect effects

Efficiency
- Better Data
- Standardized Formats and Process
EMERGING MEDIA CAPTURE – MOVING FORWARD

- Model market level impressions weighting by ad position and separating mobile and desktop activity
- Impressions perform better than clicks

- Model market level impressions separating mobile and desktop and by gender if significant activity exists
- Impressions and reach perform better than clicks
MODELS REFLECTING REAL BEHAVIOUR

A network learning approach identifies multiple paths to purchase, which can be used to attribute sales due to direct and indirect impact.
TV AND DIGITAL DIRECTLY & INDIRECTLY INFLUENCE SALES

Direct & Indirect Media sales drivers

- TV GRPs drive social impressions & search clicks
- Search clicks drive Facebook impressions
- Google Search clicks drive sales *(Users on path to purchase)*

1. Increasing TV GRPs will lead to more Facebook impressions.
2. Increasing Facebook impressions drive Google search clicks.
3. Amplify interaction by giving digital with a similar look & feel to traditional media
WHAT IS NEXT?
ATTRIBUTING VALUE TO INDIVIDUAL EXPOSURE TO MEDIA AND IN STORE

Target Customers

<table>
<thead>
<tr>
<th>Display Ad</th>
<th>Video Ad</th>
<th>Social</th>
<th>Email</th>
<th>Search</th>
<th>Brand web site</th>
<th>Ecommerce store</th>
<th>Physical Store</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$88</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$30</td>
<td></td>
<td>$60</td>
<td>$9</td>
<td>$51</td>
<td></td>
<td>$48</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>$57</td>
<td></td>
<td>$64</td>
</tr>
</tbody>
</table>

Attribution Value

Real-time Analytics
STORE ATTRIBUTION OPENS UP FURTHER OPPORTUNITY TO RATIONALISE SPEND

What is the profile of my store?

<table>
<thead>
<tr>
<th>Who is the shopper?</th>
<th>Where do they live?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category / Brand</td>
<td></td>
</tr>
<tr>
<td>Which stores have the greatest opportunity?</td>
<td>How can you engage with them?</td>
</tr>
</tbody>
</table>

Each individual store has its own ‘trading area’ based on the likelihood of shoppers visiting the store (drive times, store size, available spend, population density etc...)

<table>
<thead>
<tr>
<th>Category</th>
<th>A65</th>
<th>C1</th>
<th>C2</th>
<th>D/E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Families</td>
<td>86</td>
<td>113</td>
<td>65</td>
<td>152</td>
<td>104</td>
</tr>
<tr>
<td>Teenage Families</td>
<td>73</td>
<td>93</td>
<td>55</td>
<td>141</td>
<td>91</td>
</tr>
<tr>
<td>Adult Families</td>
<td>60</td>
<td>77</td>
<td>50</td>
<td>121</td>
<td>77</td>
</tr>
<tr>
<td>Independent Adults</td>
<td>203</td>
<td>259</td>
<td>90</td>
<td>197</td>
<td>193</td>
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<tr>
<td>Mid-Life Singles</td>
<td>95</td>
<td>109</td>
<td>61</td>
<td>127</td>
<td>104</td>
</tr>
<tr>
<td>Senior Singles</td>
<td>44</td>
<td>54</td>
<td>32</td>
<td>82</td>
<td>61</td>
</tr>
<tr>
<td>Mid-Life Couples</td>
<td>50</td>
<td>68</td>
<td>37</td>
<td>87</td>
<td>62</td>
</tr>
<tr>
<td>Senior Couples</td>
<td>32</td>
<td>38</td>
<td>22</td>
<td>62</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>120</td>
<td>53</td>
<td>120</td>
<td>100</td>
</tr>
</tbody>
</table>

Source Spectra: Based on consumer panel and census model
WHICH CATEGORIES ARE THE MOST IMPORTANT?

Category potential demand by store

<table>
<thead>
<tr>
<th>Category / Brand</th>
<th>Who is the shopper?</th>
<th>Where do they live?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand by Store</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source Spectra: Based on consumer panel and census model
MAXIMISING LONDON & SE OPPORTUNITIES

Comparing the competitive landscape based on ‘demand’

Total Brand A Demand
London & SE

Total Brand B Demand
London & SE

Demand Index
- 99 and below
- 100 - 119
- 120+
PRICE & PROMO MECHANIC COULD SUPPORT BRAND A IN LONDON

Competitors growth ‘opportunity’ is stronger

Target the ‘right’ activity in the best locations
MAXIMISING MEDIA AND PROMOTIONAL INVESTMENTS
An evolving story

The promotional drug remains a key investment challenge in the UK.

Pricing and Promotional analytics are becoming more focussed on the depth of execution and below the line activity in the store.

Execution at store level and the potential to adapt investment by local market condition is increasing and shaping our measurement.

Digital investment and individual usage of devices challenges traditional measurement – more granular inputs, more personal in its approach.
USING DOWNSTREAM DATA TO IMPROVE FORECAST ACCURACY

JULIAN BRIDLE
JOHN SPOONER
• Sense demand faster
• Align demand with supply
• Higher customer service level
  • Higher availability
  • Lower inventory cost
  • Lower waste
  • Lower working capital
IT IS NEVER A SMOOTH JOURNEY…

Your Plan
Grow Revenue by 10%

**Business Goals**
- Improve availability
- Reduce supply chain costs
- Reduce fresh produce waste
- Reduce manual overrides
- Fewer, but more effective promotions

**Business Objectives**
- Out-of-stocks running at 6%
- Promotional out-of-stocks running at 15%
- Fresh produce promotions over-allocated
- 40% of all orders are manually adjusted
- Unable to assess impact on category sales

**Business Impact**
- Forecasting system doesn't take account of causal effects
- Cannot forecast future promotion demand with accuracy
- Forecast error is too high
- Cannot forecast new products
- There are too many promotions

**Discovery Findings**
- 40% of all orders are manually adjusted
- Unable to assess impact on category sales
- There are too many promotions
- Forecast error is too high
- Cannot forecast new products
- Cannot forecast future promotion demand with accuracy
- Forecasting system doesn't take account of causal effects
- Out-of-stocks running at 6%
- Promotional out-of-stocks running at 15%
- Fresh produce promotions over-allocated
- Fewer, but more effective promotions
- Reduce supply chain costs
- Reduce fresh produce waste
- Reduce manual overrides
- Improve availability

SAS FORECASTING  CHALLENGES

- Worldwide, 8-10% of items are out-of-stock at any one time
- 16% of Out-of-Stocks are caused by inadequate shelf capacity.
- 47% of Out-of-Stocks are a result of poor demand forecasting and ordering
- Promotional out-of-stock rate = 17.1%
- UK grocery promotional levels are the highest in Europe, with 55% of food items and 59% of non-food sold on promotion

“Price is a lever for demand. It impacts supply and can impact customer perception of the retailer, both directly and indirectly through levels of supply”

The Next generation of Pricing, Retail Systems Research

Sources
All detail “Retail Out-of-Stocks: A Worldwide Examination of Extent, Causes, and Consumer Responses.”
D. Corsten (Kuehne Institute for Logistics, St. Gallen, Switzerland) & T. Gruen (University of Colorado, USA), except 1 Gruen, Corsten, and Bharadwaj 2002
IRIWorldwide - Price and promotion in Europe: FMCG industry at a tipping point.”
• An activity that stimulates demand by offering the consumer an incentive to purchase a product.
  • Events
    • Usually holistic, e.g. Halloween, Easter, Period 1
  • Campaigns
    • Usually holistic, e.g. TV, media, Direct Mail, Range Launch
  • Promotions
    • A price-discounting mechanic usually specific to a brand or other group of products, e.g. 25% off, BOGOF, Buy 2 for X
  • Support
    • Supporting mechanics, e.g. Circular, In-store Display
WHY RUN PROMOTIONS?

- **Inform** prospective customers about the benefits of a product or brand
- **Influence** feelings, beliefs or behaviour
- **Persuade** customers to purchase the product instead of another product that may also satisfy the same need.
- **Remind** customers of the benefits to encourage loyalty
SAS FORECASTING  PROMOTION GOALS

- Generate sales and stimulate growth
  - Support new product introductions
  - Gain trial & multi-point purchases
  - Build brand perception / enhance image
  - Up-trade consumer to more profitable products
  - Switch from inferior competitive brands
  - Support failing products
  - Clearance
• Which Mechanic is more appealing to the consumer?

- £1.19
- Buy 3 Get 1 Free
- 25% Off
- Save £0.40
PROMOTIONS ARE COMPLEX
• Capacity planning
  • Promoted products
  • Cannibalised products
• Replenishment
• Temporary switch in demand
• Rewards already loyal customers
• Margin reduction
• Lack of visibility across the organisation
• Consumer perception – positive / negative
FORECASTING CHALLENGES NEED SOPHISTICATED MODELS

- **Events**
  - Weather
  - Competition

- **Calendar**
  - Moving Holidays, Christmas

- **Causal**
  - Price & Promo
    - Weather

**Patterns** + **Error** = **Forecast**

**Trends**

**Seasonality**

**Cycles**
A FORECASTING ENGINE

Original Series

Trend-Cycle Component

Seasonal Component

Events

Noise Component
A FORECASTING ENGINE

Original Series

Trend-Cycle Component

Seasonal Component

Events or Promotions

Noise Component
THE FORECASTING ENGINE

These forecast components are then re-combined to produce a total forecast.
FORECASTING

THE RIGHT ANALYTICS FOR THE JOB

- Millions of Forecasts Needed
- Need Results Quickly
- Lack Skilled Resource
- Models Not Known
- Events & Drivers Affect Accuracy
- Extensive Modelling Capabilities
- Scalable
- Automated
- Exception Managed
- Automatic Model Selection
- Inaccurate Forecasts Used
We can look at past events and see if mistakes were made, and put them right next time. Or look at successes and try to replicate them. SAS is very good at providing visibility on the forecasts, to measure accuracy.

Gail Richmond
Manager - Branch Ordering Development

Daily 4 million store / sku combinations
Fast and accurate demand forecasts
Stockholding reduced by 8%
Wastage reduced by up to 4%
Higher product availability