New Frontiers in Pricing Analytics

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About Me

• Background
  – *Currently EVP and Practice Leader, IRI Strategic Analytics*
  – Founder and President of a Healthcare Analytics and Strategy firm – Analytic Harmony Inc.
  – 10+ years of management consulting experience primarily with Booz, Allen Hamilton (now Booz&Co/Strategy& as well as Archstone Consulting
  – 5 Years of academic experience as an Assistant Professor of Marketing at The Australian Graduate School of Management, Sydney and a Visiting Professor at The Anderson School, UCLA

• Education
  – Ph.D. in Marketing (University of Iowa)
  – MBA (University of Rajasthan, Jaipur, India)
  – B.A. Honors Economics (University of Rajasthan, Jaipur, India)
IRI is a global market research leader, partnering with clients to drive profitable growth from strategy to outcomes

**ADVISOR TO THE WORLD’S LEADING CPG AND RETAIL COMPANIES**

- Heritage of Innovation Since 1979
  - InfoScan Data (1987)
  - ScanKey Panel Data (1993)
  - IRI Liquid Data (2008)
  - Rentrak and ComScore partnership (2014)
- Partner to >95% of Fortune 100 CPG and Retail Companies
- Full range of tools and services including Market Measurement, Consumer Intelligence, Predictive Analytics and Strategic Consulting
- Supported by 4000+ Professionals Globally
  - Deep industry and domain expertise; average associate has >15 years industry experience
- Clients Value IRI: >95% Contract Renewal

**ESTABLISHED GLOBAL PRESENCE AND NETWORK**

- Global Delivery System Enabling Speed and Competitive Advantage
  - 11 U.S. Offices – Headquarters in Chicago
  - 7 European Offices – Headquarters in UK
  - Analytics Center of Excellence
    - Athens, Greece
  - Global Operations Center
    - Bangalore, India
- Partnership around the world expand coverage: CCR, Intage, Aztec, BMI
- Global Panel coverage via partnership with Worldpanel
IRI operates within the Consumer Packaged Goods (CPG) industry

**What is CPG?**

Consumer Packaged Goods (CPG) are every day products consumed by the average consumer such as food and beverages, household products such as cleaning, health and beauty products etc.

**How does it work?**

Manufacturers produce goods...

As a manufacturer, there are so many strategic and tactical issues that need to be determined

Work with retailers & distributors to get products to retail stores...

Where consumers purchase products for consumption

For instance:

- What products should I sell?
- Where should I sell?
- Who should I target?
- How much price do I charge?
- How do I market & promote my products?
Agenda

1  The CPG Industry and Change Imperatives

2  The New Frontiers of Price-Promo Analytics

3  Discussion and Questions
The US CPG industry is entering a new phase in its evolution – multiple forces at play in reshaping industry dynamics

**US Total Retail vs. CPG Sales Growth**
Dollar sales, % chg. vs. YA

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Retail</th>
<th>CPG Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>3.2%</td>
<td>1.7%</td>
</tr>
<tr>
<td>2014</td>
<td>4.7%</td>
<td>2.3%</td>
</tr>
<tr>
<td>2015</td>
<td>4.2%</td>
<td>3.0%</td>
</tr>
<tr>
<td>2016</td>
<td>4.0%</td>
<td>1.6%</td>
</tr>
<tr>
<td>2017</td>
<td>3.8%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

**Drivers of decreasing share of spend**

- **Shifting interests**
  Greater emphasis on experiences, driving more spend on entertainment and food-away-from-home

- **Unequal income growth**
  Greater income growth among the top 20%

- **Growth of online CPG**
  Online sales are growing in share of CPG, causing depressed growth in B&M

1. Total Retail and foodservice, excluding auto and gas as per US Census. Includes grocery, general merchandise, clothing, electronic, appliance, book & hobby, furniture, building materials, health & personal care, & online retailers. 2. CPG scans as measured in IRI MULO+C. 3. Based on share of annual expenditure as measured by Consumer Expenditure Survey as per US Census 2013-16. 4. Based on US Census Mean Household Income Received by Each Fifth and Top 5 Percent, 2016.

Consumer demands on CPG retail are evolving amid changing household dynamics, increasing technology, and saturated retail

**Household dynamics**

- Millennials have overtaken Boomers as the largest generation of adults\(^1\)
- 57% of Women (16+) participate in the workforce, the highest ever\(^2\)
- 1 and 2 person households are growing\(^4\).
- More Americans than ever (83%) live in Urban areas\(^3\)
- African Americans, Asians and Hispanics continue to grow population share\(^4\)

**Environment**

**Increasing technology**
- Greater transparency via online shopping for CPG
- Awareness via social and viral culture
- Increased mobile engagement

**More choices**
- Over-Saturation of retail stores
- Expanded Product Selection\(^5\)
- More channels (e.g., online, meal kit, hard discount, etc.)

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The Retail Landscape and Competition are Evolving Rapidly

Smaller Formats, Value Formats

- Walmart
- Lidl
- Aldi
- Dollar General
- Kroger
- Express

eCommerce Gaining Traction

- Amazon
- Peapod
- Walmart
- Jet
- Blue Apron
- Instacart
- Prime Pantry
To drive growth, companies are increasingly investing in pricing and promotions.

**Total Store Sales on Merchandising – MULO+C**

Dollar Sales in $B

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales in $B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>$187.8</td>
</tr>
<tr>
<td>2012</td>
<td>$196.0</td>
</tr>
<tr>
<td>2013</td>
<td>$201.3</td>
</tr>
<tr>
<td>2014</td>
<td>$206.2</td>
</tr>
<tr>
<td>2015</td>
<td>$212.5</td>
</tr>
<tr>
<td>2016</td>
<td>$220.4</td>
</tr>
<tr>
<td>2017</td>
<td>$227.5</td>
</tr>
</tbody>
</table>

Est CAGR 3.1%

“*Our company views Revenue Management as purely price and promotion*”
- IRI Client – RM Executive

Source: IRI Total Store Advantage Total US MOC
However, the impact of price-promo actions is rapidly declining

**Total Store Average Sales Lift on Merchandising – MULO+C**

<table>
<thead>
<tr>
<th>Year</th>
<th>Lift %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>42.5%</td>
</tr>
<tr>
<td>2012</td>
<td>41.5%</td>
</tr>
<tr>
<td>2013</td>
<td>41.0%</td>
</tr>
<tr>
<td>2014</td>
<td>39.8%</td>
</tr>
<tr>
<td>2015</td>
<td>38.5%</td>
</tr>
<tr>
<td>2016</td>
<td>37.0%</td>
</tr>
<tr>
<td>2017</td>
<td>36.9%</td>
</tr>
</tbody>
</table>

Source: IRI Total Store Advantage Total US MOC
CPG Manufactures need to think of Revenue Management as a holistic on-going program rather than simply tactical price-promo management

**Revenue Management**

**Create the Right Strategic Platform**
- Link Revenue Management Strategy to Marketing and Portfolio Strategy
- Develop Price-Pack Architecture
- Innovate into Key Demand Spaces Based Upon Consumer Willingness to Pay

**Monitor and Refine on an Ongoing Basis**
- Develop Investment Effectiveness Scorecards
- Leverage Technology/Tools To Drive Insights and Understand Outcomes and Root Causes
- Refine Strategy and Guidelines Periodically

**Develop Channel Activation Program**
- Focus on Category and Retailer Growth in Price-Promo Programs
- Develop Retailer-Specific Workflows and Activation Plan

**Develop Infrastructure and Capabilities**
- Design Trade Strategy and Structure
- Develop Price-Promo Analytics and Solutions
- Ensure Process and Organizational Alignment
- Set Price-Promo Brand & Investment Guidelines
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In CPG, Technology, Big Data and the Need for Speed is Changing the Game

**Demand Identification**
- Products, Consumers, Need States

**Product Development**
- Features and Benefits

**Product Marketing**
- Communication, Targeting, Channels

**In-Market Execution**
- Pricing, Assortment,

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**Highlights**

- A typical grocery store puts 5,000 items on sale in a week and removes sale prices from another 5,000. That creates an abundance of mismatches when workers print out the new price labels in a back room.

- Altierre, a digital tag and sensor outfitting a store with 20,000 to 25,000 tags, each costing about $5, would produce labor savings that would pay back the investment in two to two-and-a-half years.

- Nebraska Furniture Mart puts electronic price tags on products within price sensitive categories. It then checks competitors' online prices and updates digital tags each day to meet its low price promise.

Electronic price tags create opportunities for not only cost savings, but revenue generation via dynamic pricing.

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**Modern Analytics**

- Speed to Insights
- Manage Complexity
- Scale Analytic Expertise

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Current modeling platforms are evolving

Benefits of our Liquid Modelling™ Platform:

**Broad**: Delivery of all cross-products interactions; 360° category insight

**Fast**: Quick responses to market changes and tracking via regular updates

**Flexible**: Dynamic shaping & viewing of results at various geographical & product levels

**Scalable**: Consistent handling of large number of products, variables and interactions

**Universal**: One process for data prep, models, drivers and results across countries-categories
The new pricing paradigm

Traditional Price-Promo Models

• Based upon historical data and supervised learning
• Regression based elasticity models
• Predictive not Prescriptive

Next Generation Price-Promo

• AI/ML (PySpark, Hadoop) based deep learning algorithms
• Market trends trigger action
• Prescriptive tactics, real-time, scalable
Applications of AI/ML are changing life

Voice Recognition

Image Recognition

Cognition via Robotics
Key Aspects of Next-Gen Pricing

**Leveraging Machine Learning**

- Systems have the ability to learn from data *without being explicitly programed*…
- Integrated pricing analytics helps **learning** as system is **exposed to more data**…
- **Super-human performance** levels in executing regular “manual” tasks…
Price Recommendation Engine: Automatically Identifies Price-Driven Growth Opportunities

Price Intelligence

**EXAMPLES**
- Fix PPG1, PPG2 Price Gap to PL
  - Alert! PPG1 Price = $1.99
- Brand B Gap to Competitive Brand C Kroger vs. WM
  - Alert! Kroger Price >20% higher than WM
- PPG3 Nashville vs. SE
  - Alert! PPG not line-priced across regions

Rules Engine Category and Elasticities

**Mine Historical Trends**

- Lower price of Brand A; push X to $3.20
- Raise Price of Brand A to $2.50

**Use Price & Promo Elasticity**

**Simulate Scenarios**

Price Recommendations

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Retailer</th>
<th>Potential Sales Upside</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower price of Brand A; push X to $3.20</td>
<td>Kroger</td>
<td>$70,000</td>
</tr>
<tr>
<td>Raise Price of Brand A to $2.50</td>
<td>Nashville Grocery</td>
<td>$40,000</td>
</tr>
</tbody>
</table>

**WATCH-OUTS**

- Monitor Rising Price Gap to Private Label
- Monitor Price Cut of Competitor B

Automatically searches for thousands of price gaps
Trend Spotting:
A Dynamic and Real Time Algorithm to Spot Trends and Anomalies

**PATTERN RECOGNITION**
Use Deep data mining techniques to identify sales patterns showing consistent long-term growth or short-term growth spurts.

**TREND DETECTION**
Separate pure trends from investment related growth by relating patterns in sales to changes in causal drivers.

**ATTRIBUTES THAT MATTER**
Apply Clustering algorithms on trending products using coded attributes – to identify the hottest trends driving growth.
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QUESTIONS
Thank You!