in4mation insights

Engineering Your Competitive Advantage

Analytics4RGM

White Paper

In the RGM space, in4mation insights is positioned as a company with elite econometrics expertise and practical know-how. At the same time, our history of engagements has required us to consider how to implement the output of models in corporate systems of price governance, including full integration of modeling outputs with enterprise salesforce tools.

Using our RGM tools, we estimate that a well-executed program realize a margin increase of 50 basis points and a revenue increase of 2% to 4%. In terms of how fast we can reach this goal, we concur with Gartner that executives responsible for RGM should initiate small, focused projects to gain expertise and support, then leverage this insight and sponsorship to a broader and global set of products and markets.[1]

Our expertise falls into four broad realms:

1. Macro pricing
2. Product/market strategy involving deep understanding of consumer demand
3. Optimization of transactions
4. Operationalization of analytic outputs

1. Macro Pricing

Each category in each global economic stage requires high level domain expertise to understand the core issues and possibilities with respect to price. For instance:

- In the US confectionary market during the Great Recession, we helped to manage regular prices upward, tracking the price premiums that were possible due to heavy investments in equity advertising
- For a top US toy company, we developed systems to manage and optimize price for over 3000 toys which involved dealing with very high product churn rates and high off-setting impact from movie licenses
- For a US brewer operating in South America, we optimized portfolio pricing strategy in an environment of intense competition and poor retailer price compliance
- For the CSD market in Japan, we provided expertise in how to manage prices upward in a market slowly recovering from long-running deflationary pressures to lower price.

The particular national environment and category characteristics require the use of different data and analytical approaches, even a different problem-solving mindset. Some of the areas also requiring a macro expertise are (not exhaustive):

- Predicting the downstream impact of commodity prices

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[1] Chris Fletcher. Marketscope for Price Optimization. Gartner 2013

- The strategy and tactics of regular price increases in markets with mild inflation
- Understanding how long it takes consumers to adapt to a price increase
- Understanding the power of brand advertising to offset price sensitivity
- Price and package dynamics during a price war
- Pricing across distribution channels and in regulated industries (beer)
- Retail and manufacturer perspectives/interests

2. Product/Market Strategy

This is about the parts of pricing and RGM that are within control of the firm's marketing or R&D divisions but that also involve things outside its immediate control such as the price sensitivities of the consumer and the actions of competitors.

The key engine of this phase of RGM is research into consumer demand at the individual (not the aggregate) level. Ultimately our client's goal is create a product or service that has optimal value versus competition against a specific market segment. That is the key to growing share within a category or to understanding how to exploit adjacencies to fundamentally change categories. In4mation insights most upstream tool in this space in the motive model:

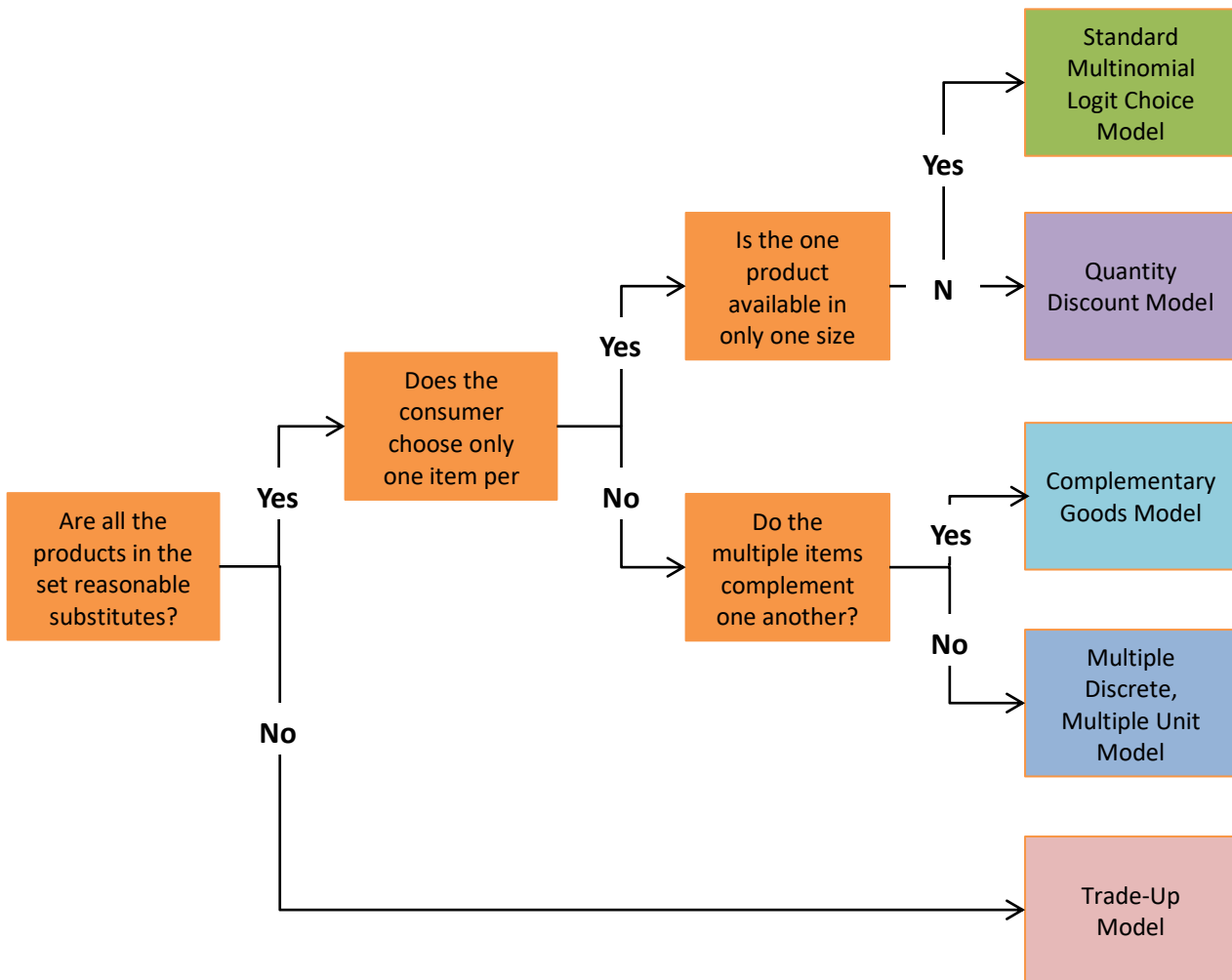| Consumer / Consumption Context | Motives | Attribute Importance | Brand Preference | Market Share |

The purpose of this model is to understand how evolving consumer needs change the demand for product attributes. Also, depending on perceptions of quality, social trends, advertising and other factors, products with more desirable attributes will command higher prices. This method both identifies the desired attributes and measures how much a consumer is willing to pay for them.

In addition to this, in4mation insights uses many other types of primary demand models to understand consumer behavior with respect to price, package and competition:

- Structuring a portfolio – provide profit or revenue-optimal price indexes versus competition for each item in a portfolio
- Optimizing value versus competition – identify attributes that consumers are willing to pay for and estimate how much more
- New product pricing – test the value of attributes and price sensitivity for new to market products

- Line extension analysis – how best to enhance an existing product line
- Trade up analysis – when goods are of different quality, measure consumers' willingness to trade off goods outside the category to afford a lifestyle change (also called an *income* effect)
- Simultaneously optimize pack mix and price – when is a smaller pack of a superior product better than a larger pack of an inferior one?
- Complimentary goods model – blades and razors, regimens, kits, sets
- Multiple goods model – when consumers want variety

These various types of choice models and the behaviors they model are summed up in this chart:

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Are all the              Yes    Does the            Yes    Is the one          Yes    Standard
products in the   ───────────▶  consumer     ──────────▶   product      ──────────▶   Multinomial
set reasonable                  choose only                available in                Logit Choice
substitutes?                    one item per               only one size   N           Model
                                                                            ───────▶   Quantity
                                                                                       Discount Model
                                               No
                                                     Do the          Yes    Complementary
                                                     multiple items  ─────▶  Goods Model
                                                     complement
                                                     one another?    No      Multiple
                                                                     ─────▶  Discrete,
                                                                             Multiple Unit
                                                                             Model
                  No
                  ───────────────────────────────────────────────────────▶  Trade-Up
                                                                             Model
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3. Optimization of Transactions

This is the part of pricing considered to be the "heavy lift." Large amounts of transaction data need to be gathered, cleaned and then run through efficient modeling and optimization algorithms. Then the outputs need to channeled into operational systems close to pricing decision-makers.

In this area, we bring world-beating Bayesian model technologies that can handle many hundreds of GB of data in sophisticated models that may require from 20 to 200 variables and that outperform the more generic models of the big IT shops. In the area of transactions analysis, we have seen the development of new data sources and delivery mechanisms:

- Web-crawling agents that gather (competitive) prices
- Integration with e-commerce
- SaaS and cloud deployment models
- Access on mobile and tablet devices
- Growing willingness to create and manage micro-segments.
- Better visualization methods
- Emergence of sources of inventory and competitive data
- Integration of internal and external sources

Although "big data" looms on the horizon, most applications involving transactions data still depend on a well-managed internal sales database or an external syndicated source such as Nielsen, IRI or Gfk. How big the data are depends on where they fall on the dimensional continuum as shown in the tables below:

	Small Data	Medium Data	Big Data
Spatial/Geo	Market	Store	Individual
Product	Brand	PPG	UPC/SKU
Time	Week	Day	Minute
Measures	10	100	1000
Devices	1	2	5

Most applications in RGM still fall into the "small-medium" bucket rather than big data. An additional issue with RGM is the extent to which it is possible (or desirable) to scale our models to accommodate data at full granularity. Data granularity is often best at "one level below" the remit of the decision-maker. So a regional pricing manager will usually want regional data with the option to drill down to DMA; a portfolio manager will want to see each individual brand; a sales specialist working on Walmart will like to see the PPG (price-promoted-SKU-group) with the option to drill down to UPC if necessary.

The analysis and modeling of transactions data falls into a few layers:

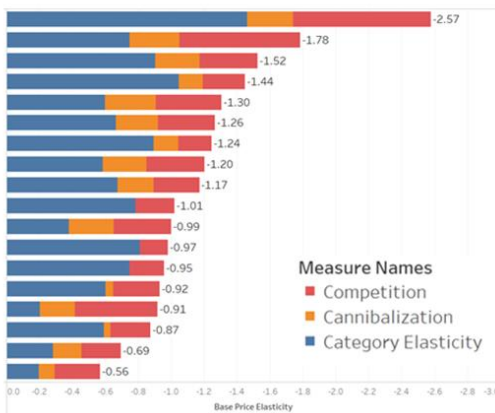1. Descriptive/exploratory analysis/visualization:
   - Price, price gap and sales trend analysis by brand/channel
   - Decomposition of revenue into price and pack mix components
   - Identifying outliers and exceptions
   - Identify zones of cannibalization and competition (see chart below)
   - Identification of classes/segments of people or points-of-sale
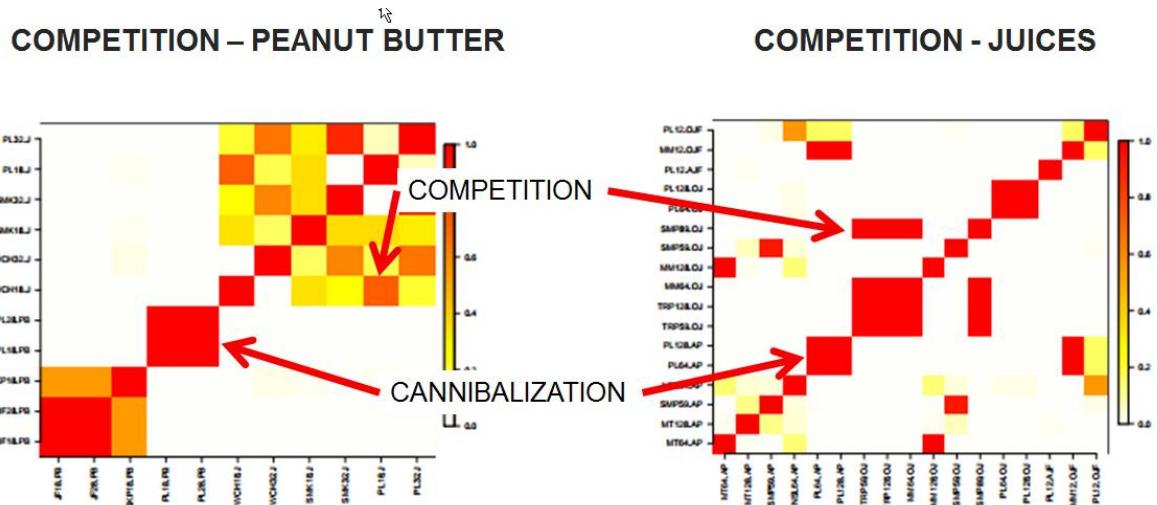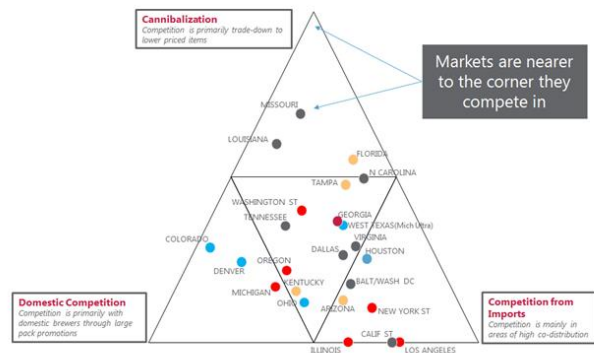

2. Econometric modeling/optimization of regular or frontline price
   - Calculate price elasticity by product, product family and distribution channel
   - Decompose price elasticity into parts attributable to category elasticity, within-line cannibalization and competition (see chart below)
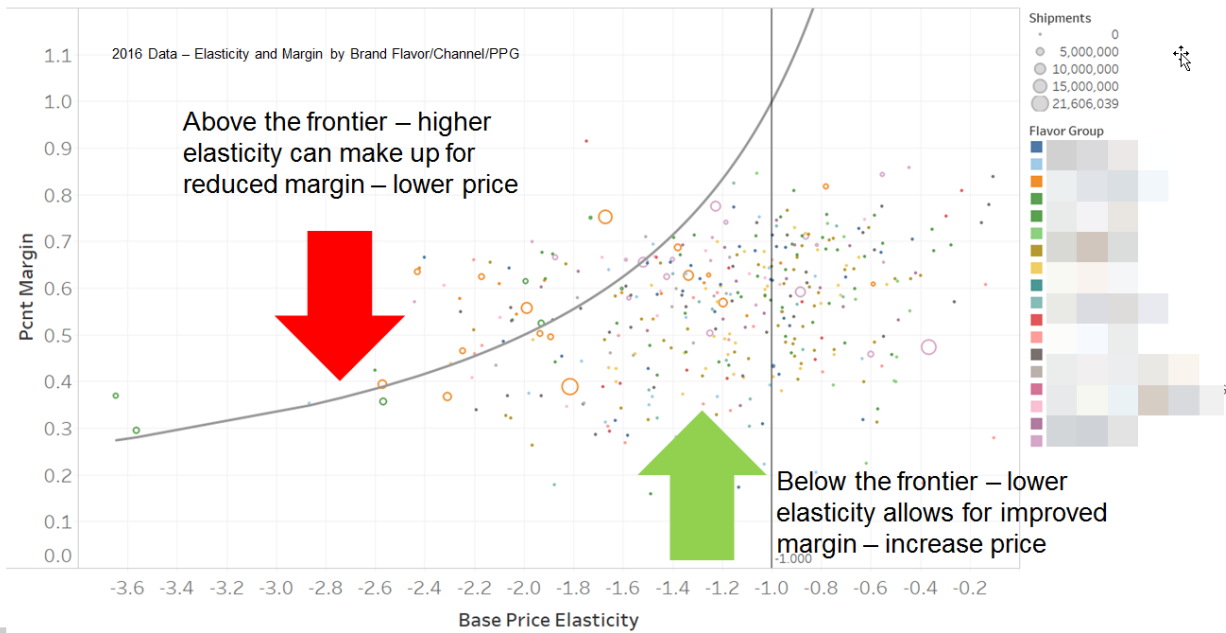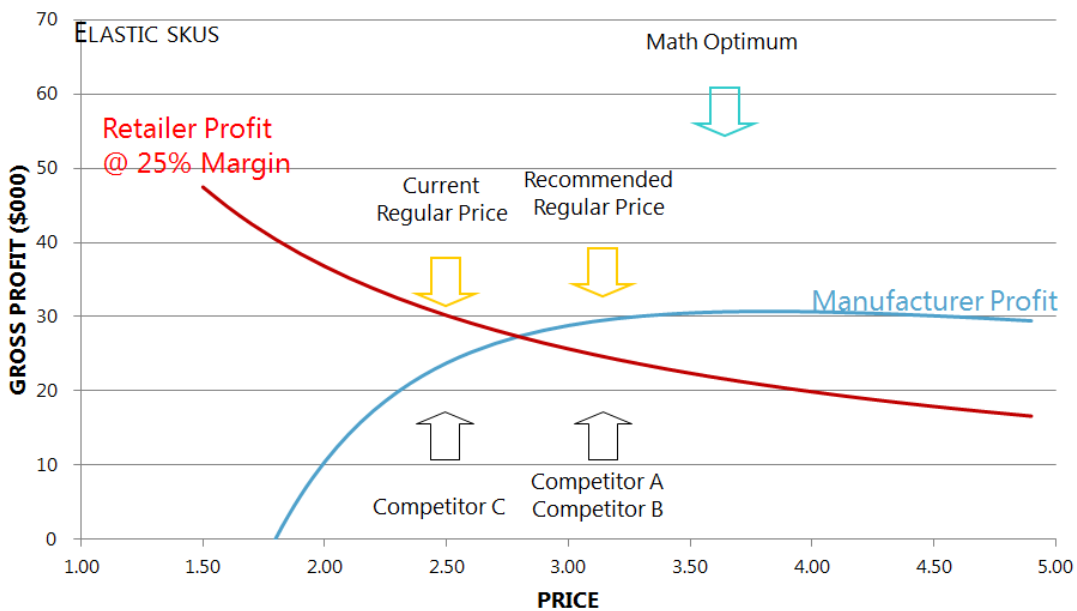
- Use product margins and elasticity to evaluate the profit frontier (see chart below)

2016 Data – Elasticity and Margin by Brand Flavor/Channel/PPG

Y-axis: Pcnt Margin (0.0 to 1.1)
X-axis: Base Price Elasticity (-3.6 to -0.2)

Above the frontier – higher elasticity can make up for reduced margin – lower price

Below the frontier – lower elasticity allows for improved margin – increase price

Shipments
- 0
- 5,000,000
- 10,000,000
- 15,000,000
- 21,606,039

Flavor Group

- Apply constraints to optimization based on corporate goals (revenue, share, profit)
- Develop optimal pricing strategies by product, product family, customer, segment, distribution channel taking into account impact on retailer and applying volume or share constraints
- Develop the optimized price points taking into account key price thresholds and competitive gaps (see chart below)
- Forecast volume, revenue and share under different strategies

Y-axis: GROSS PROFIT ($000) (0 to 70)
X-axis: PRICE (1.00 to 5.00)

ELASTIC SKUS

Math Optimum

Retailer Profit @ 25% Margin

Current Regular Price

Recommended Regular Price

Manufacturer Profit

Competitor C

Competitor A
Competitor B

3. Trade optimization –
   - Optimize the duration and frequency of trade tactics such as:
     - Primary and secondary displays
     - Feature ads
     - Circulars and flyers
     - Coupons/rebates
     - Mobile phone apps linked to trade
     - Sweepstakes
     - Gifts
   - Optimize depth, duration and frequency of discounts
   - Optimize revenue and profit by manufacturer and retailer for BOGO-style deals such as "Buy one get one, "Buy two get one," "Buy one get 50% off next one" etc.
   - Analyze the quadrant chart of base price elasticity versus tactics to guide the best regular price and promotion strategy by product and distribution channel (see chart below)

	Higher Lift from Price Discount	
More Elastic Base Price	**HIGHLY COMPETITIVE** *Opportunity to decrease prices* *Value through occasional discounts* • More expandable categories • More substitutable products	**WINNER'S CIRCLE** *Maintain/opportunity to raise prices* *Offer limited discounts for visibility* • More expandable categories • Less substitutable products (desirable, classic, unique)
	EDLP *Opportunity to decrease prices* *Value through everyday low price* • Less expandable categories • More substitutable products	**NEED & WILL PAY** *Maintain/opportunity to raise prices* *Selective discounting* • Less expandable categories • Less substitutable products (necessities) • Brand is a key differentiator	**Less Elastic Base Price**
	Lower Lift from Price Discount	

   - Use optimization methods to redeploy promotion dollars to more productive brands, channels and tactics
   - If trade costs are available, evaluate the ROI of promotions

4. Financial and supply chain factors – these efforts usually require less complex analysis and a lot of legwork, organization follow-through, etc. Essentially, the organization sets about increasing "penny profit" by identifying and curtailing margin leaks. These leaks usually occur because of all the incentives in place to drive product through the distribution chain. Examples of areas of focus are:
    - Annual volume bonus
    - Cash discount (terms)
    - Consignment costs
    - Cooperative ads
    - End-customer discount (e.g. scanback promotions)
    - Freight
    - Market development funds, CSAs
    - Off-invoice promotions
    - Online order discount
    - Performance penalties
    - Receivables carrying costs
    - Slotting allowances
    - Stocking allowances

4. Operationalization of analytic outputs

This is the process that provides guidance and governance for product pricing, administration and integration with sales force automation (SFA), enterprise resource planning (ERP), order management and other related applications used by salespeople. Price execution provides integration with tactical sales tools, such as configure price quote (CPQ) systems, as well as sales-effectiveness systems that automate the pricing process
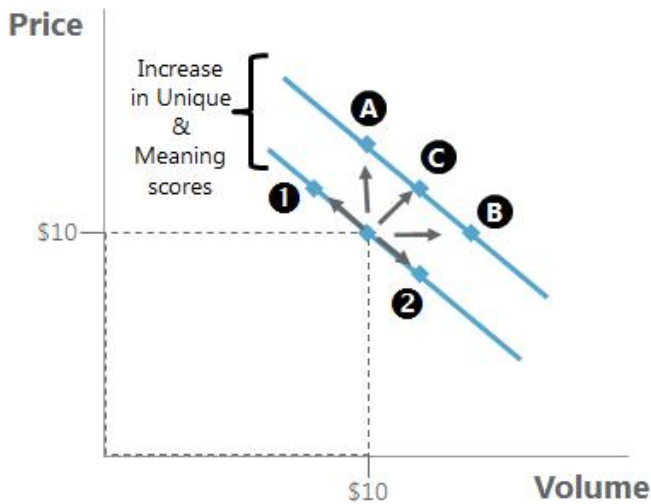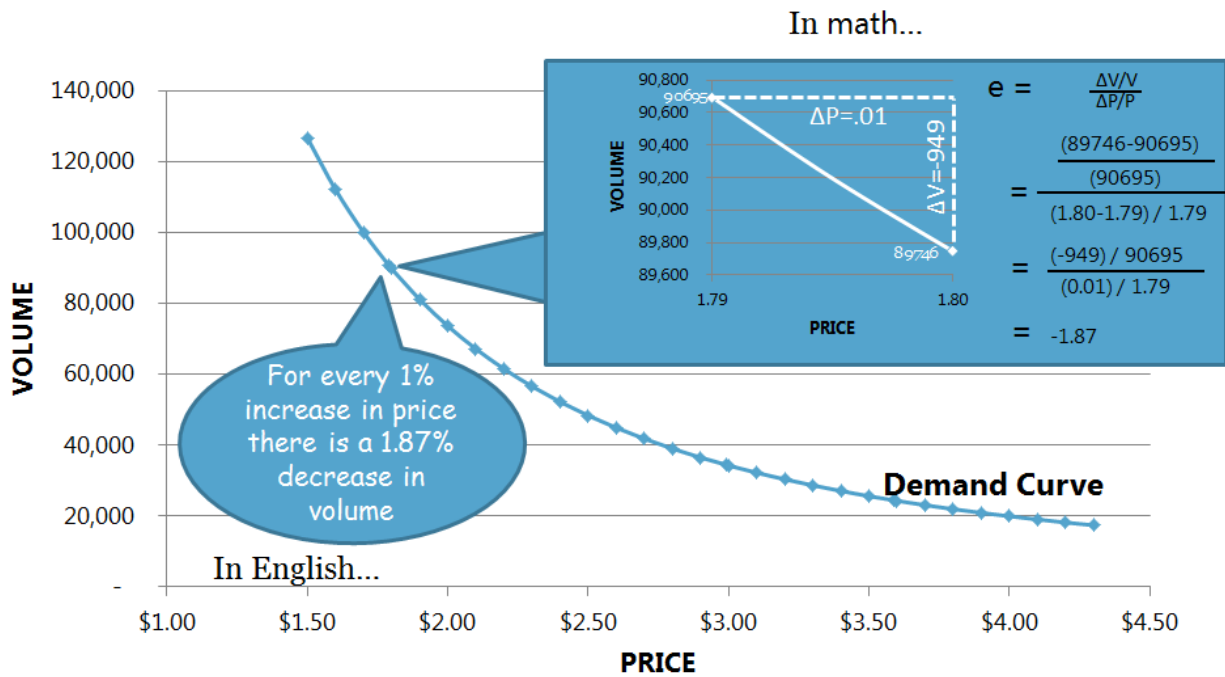
- Price guidelines/guardrails – one time/systematic
- Price "corridors" / ranges of operation
- Retail sell-in stories/category management applications
- Export optimized data to business planning and order systems
- Incorporate pricing compliance, rules, policies and guidelines
- Develop price review/approval/exception workflows
- Automatic monitoring of pricing governance

Although a relatively small firm, in4mation insights has deep experience linking a dedicated analytics server to an enterprise order system for a major US confectionary company.

Why is in4mation insights better than other RGM vendors?

1. Most large scale RGM analytics operations have long recognized the value of Bayesian econometric systems. They are more accurate, provide more detail at product and channel level and more amenable to overrides based on good judgment. In4mation insights takes this one step further with Robust Bayes^{SM}. This technology, developed in conjunction with Prof. John Liechty (PhD Cambridge UK) allows for more accurate estimates of less frequent promotions, of promotions that only occur in some channels/retailers or promotions that occur for only some products. For instance, mobile phone tie-ins to trade are rare and because they do not occur for many retailers and products, we might be tempted to eliminate them from analysis. Robust Bayes^{SM} guarantees that they can be included.

2. We have experience applying out Analytics4RGM suite across the globe and in many different verticals. We also have deep experience in regulated industries (e.g. SABMiller)

3. Our modeling is better. This is hard to quantify and every vendor claims it. Our superior modeling is reflected in our ability to do expert work in both conjoint and database-driven econometrics. It is reflected in our ability to cover the range of pricing questions from the emotional/functional drivers of price sensitivity (high level marketing) to store-level tactic optimization (low level sales).

4. Experience with real-time linkage of analytic systems to enterprise order systems. We are able to advise our clients on SaaS and SwaS (software with a service) solutions. We can advise on the best strategy for building analytic engines (pre-calculated lookup versus on-the-fly what-if calculation, both in real time). We can also advise on how to link analytic engines with enterprise systems based on, for example, Siebel, Oracle or IBM enterprise systems.

Appendix: some basic concepts – what is price elasticity?

In math...

$$e = \frac{\Delta V/V}{\Delta P/P}$$

$$= \frac{\frac{(89746-90695)}{(90695)}}{(1.80-1.79)/1.79}$$

$$= \frac{(-949)/90695}{(0.01)/1.79}$$

$$= -1.87$$

ΔP=.01
ΔV=-949

For every 1% increase in price there is a 1.87% decrease in volume

In English...

Demand Curve

Increase in Unique & Meaning scores

Tactical Pricing

- Optimizes sales by finding best price vs. volume trade offs
- Trade offs move along current demand curve (to ❶ or ❷)

Strategic Pricing

- When brand investment increases differentiation (U and M scores increase), optimizes trade-off between growth and profitability
- Models impact on brand value of ❹premium pricing to boost margin, ❺parity pricing to boost growth, and ❻some of each