Marketing Optimization

By Jerry W. Thomas

Marketing is a tricky business and a dangerous career. It's almost impossible to measure the effects of advertising, packaging, distribution channels, media expenditures, social media Likes and Tweets, sales organizational structure, etc., on brand share or sales revenue.

Without good data and absent any trustworthy feedback loop, marketing managers often turn to the security of marketing myths, pop culture marketing fads, fawning at the feet of consultants, and polishing up their résumés before the ax falls.

Is marketing solely a game of chance, or might there be a way to bring scientific methods to the table? Let's draw a distinction between the micro and the macro. At the micro level, the various pieces of the marketing puzzle can be, and should be, optimized on an on-going basis. The overall positioning and strategy should be evaluated. Every ad and commercial should be tested for effectiveness. Products should be tested and optimized. Promotions should be tested. Package designs should be tested. Brand names should be evaluated.

These micro-level tests must be a constant and ongoing process of evaluation, tweaking, and reevaluation, to continuously improve the gears, bearings, and levers that make up the marketing engine. Optimizing these micro elements of marketing typically yields improvements in sales revenue and market share. But this is only the first step on the optimization stairway.

What happens when all of these elements are put together? How should the budget be allocated among the different marketing elements? How should the budget be allocated geographically? By different media? What is the optimal pricing strategy? What's the optimal level and timing of media advertising? How much money should be spent on extra salespeople versus increasing media advertising? These are the macro types of questions. These questions cannot be answered by copy testing, product testing, or other micro-testing methods. The workhorse of macro optimization is marketing mix modeling.

As a company learns what drives its individual brands, commonalities are often found that make it easier, and less costly, to build marketing models for its other brands.

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Marketing Mix Modeling

What exactly is marketing mix modeling? The term is widely used and applied indiscriminately to a broad range of marketing models used to evaluate different components of marketing plans, such as advertising, promotion, packaging, media weight levels, sales-force numbers, etc. These models can be of many types, but multiple regression techniques lie at the heart of most marketing mix modeling. Regression is based on a number of inputs (or independent variables) and how these relate to an outcome (or dependent variable), such as sales or profits, or both. Once the model is built and validated, the input variables (advertising, promotion, etc.) can be manipulated to determine the net effect on a company's sales or profits.

If the president of a company knows that sales will go up $10 million for every $1 million he spends on a particular advertising campaign, he can quickly determine if additional advertising investment makes economic sense. A scientific understanding of the variables that drive sales and profits is essential to determining an optimal strategy for the corporation. Marketing mix modeling creates a broad platform of knowledge to guide strategic budget allocations and decisions.

From a conceptual perspective, there are two main strategies to pursue in marketing mix modeling. One is longitudinal; the other is cross-sectional or side-by-side analyses. In longitudinal analyses, the corporation looks at sales and profits over a number of time periods (months, quarters, years), compared to the marketing inputs in each of those time periods. In the cross-sectional approach, the corporation's various sales territories each receive different marketing inputs at the same time, or these inputs are systematically varied across the sales territories and compared to the sales and profit outcomes. Both methods are sound, and both have their place. Often, some combination of the two methods is the most efficient.

The Data Warehouse

The greatest barrier to successful modeling is always a lack of relevant, specific, accurate data. So, the first step in any modeling effort is designing the data warehouse that will support the modeling. The next step is collecting and cleaning all of the historical data and entering it into the data warehouse, and then cleaning and entering new data on a continuing basis. Clean, accurate, highly specific data is absolutely essential to successful modeling. The data must be specific to individual brands and product lines, not the company as a whole. Attempting to model at the corporate (or aggregate) level rarely works because what is going on in one part of the company is canceling out or confounding what is going on elsewhere in the company. Here are some types of data to consider when developing the data warehouse:

- *Economic data.* An understanding of the effects of general economic variables is vital to building sound models. Some economic variables include employment and unemployment, discretionary income, inflation rates, gross domestic product, interest rates, and energy costs.

- *Industry data.* What are the trends in the specific industry? Is the market for the product or service growing? What is the rate of growth? Is international trade affecting the industry? Are important geographic differences evident within the industry?

- *Product category data.* What are the trends in the specific product category? For example, is the refrigerated soy milk category growing? At what rate? How does this growth rate vary by geographic region? What are the trends by brand?

- *Product lines and SKUs (Stock Keeping Units).* What is the history of each major brand within the category? What new products or new SKUs have been introduced, and when, for each major brand? What is the history of private-label brands and SKUs in the category?

- *Pricing data.* A history of prices for each SKU in the category is essential. Pricing differences across sales regions, across different time periods, and across brands in a category provide the data for developing precise price demand curves. Pricing is almost always an important variable.

- *Distribution levels.* What is the history of distribution levels for each product and SKU? What is the quality of that distribution? What is the average number of shelf facings per SKU?

- *Retail depletions.* It's essential to have a clean measure of sales to end users, undistorted by fluctuations in inventories. Factory shipments are worthless for modeling purposes in most instances. Retail takeaway (or retail depletions) in dollars and in

units (ounces, pounds, cases, etc.) is the most common measure of sales to consumers. The goal is to accurately measure sales to ultimate users.

- **_Advertising measures._** Money spent on media advertising is seldom useful by itself. The media advertising must be translated into television GRP (gross rating point) equivalents, or some other common "currency." That is, the print advertising, the radio advertising, the online advertising, and any other advertising must all be converted into common units of measure (typically, television GRP equivalents). The money spent by specific media type (adjusted for comparative effectiveness) is another way of weighting media inputs as variables. All of this is apt to prove worthless, however, if copy-testing scores are not included for each of the ads. A media plan of 100 GRPs per week might have no effect if a weak commercial is run, but might have great effect if a terrific commercial is aired. Likewise, the exact media schedule is important, and the length of time each commercial is on the air must be considered because of wearout effects.

- **_Consumer promotion._** Consumer (or end-user) promotions come in many forms, but the primary characteristic of these promotions (as compared to advertising) is the immediacy of the effects. Promotions are designed to have powerful, short-term effects on sales. Temporary price reductions, cents-off coupons, and "buy one/get one free" are examples of common consumer promotions. These promotions must be understood, measured, and incorporated into the models. If not fully comprehended, the promotion effects could easily overwhelm the modeling effort.

- **_Trade promotion._** These promotions usually take the form of discounts or allowances given to the trade to stage in-store promotions of some type (temporary price reductions, end-of-aisle displays, in-store signage, local advertising, and so on). Trade promotions must be comprehended and included within the models because of the sales fluctuations they cause. When the manufacturer offers one dollar off the price of each case for 30 days (a typical trade promotion), the retailer is very likely to take actions to increase sales of that brand, and to load up on inventories at the end of the promotion period.

- **_Sales-force effects._** Every company and industry is different, but the nature and strength of a company's sales force (and how it is organized, managed, and compensated) have important strategic effects. Sales organizations tend to be very expensive, so it's generally worthwhile to include sales-force variables within the models.

- **_Service effects._** If services are an important part of the customer's experience in buying and/or using a product, then this variable must be measured and incorporated into the models. For example, if a new product must be installed by a service technician, then the interaction between customer and technician might be a major variable.

Depending on the industry and product category, other variables might come into play as well. Every company and brand is unique, and identifying all of the relevant variables, figuring out how to measure them, and getting those variables into the data warehouse are the most difficult parts of establishing a successful modeling program. Most importantly, the data warehouse must be carefully maintained over time and be constantly updated, because marketing modeling cannot be a one-time thing. The models must be calibrated and reweighted on a regular basis, at least once a year. Many companies hire at least one full-time employee devoted to tracking down relevant data, cleaning it, coding it, and getting it into the data warehouse. Often, the analytical firm guiding the modeling will place employees on site to help ensure that the data warehouse is properly maintained.

Rules of Thumb

Remember that the modeling must be specific to an individual brand (or narrow line of business), because what works for one brand or one company might not work for the next brand or the next company. As a company learns what drives its individual brands, commonalities are often found that make it easier, and less costly, to build marketing models for its other brands. Here are some rules of thumb to guide the modeling work:

- **_Beware of threshold effects._** Often a marketing input (print advertising, for instance) never reaches a measurable threshold and, therefore, does not show up

as important in the models. But if the print advertising's budget had been slightly greater, perhaps it would have shown up as a meaningful variable (i.e., it would have reached the threshold of effectiveness).

■ *Be sensitive to "lagged" effects.* Some marketing inputs have immediate effects, while the effects of other inputs are "lagged" (that is, occur over time or occur at a later point in time). For example, media advertising tends to have short-term effects on sales, as well as longer-term effects.

■ *Keep it simple (at least in the beginning).* Focus the modeling efforts on a limited number of major marketing variables (the big budget items). Don't clutter up the models with a large number of trivial variables that complicate and confound the modeling work. Once the major variables are truly understood, then smaller variables can be explored.

■ *Be realistic.* It may take several years of diligent effort before the marketing mix modeling begins to pay off. There are no instant cures or short-term solutions. It is hard work, trial and error, and a long-term search for marketing truth.

■ *Seek top management commitment.* Involve the senior leadership of the corporation in the modeling effort, especially at the initial planning stages. Their understanding of the nitty-gritty details of the industry, the company, and the brands will help ensure the success of the modeling effort, and will encourage the acceptance, dissemination, and use of the results.

Who should do the modeling work? Some large companies have internal modeling departments, but most companies will outsource the modeling and analytical work. Ideally, the modeling consultants should have an in-depth understanding of marketing and marketing research, so that they really understand the complexities of the marketing variables they are trying to simulate. True, the model builders need statistical and mathematical skills, but without the marketing knowledge and marketing research experience, the modeling effort is not likely to be very successful.

Lastly, the issue of cost and ROME (return on modeling effort) must be considered. To set up and operate a comprehensive marketing mix modeling program can cost hundreds of thousands of dollars a year, or even millions per year for a large, multibrand company. Does your organization have the stomach for that kind of ongoing investment? Will your company really use the results? Will senior management heed the findings? Will the learnings be disseminated throughout the organization to improve strategic planning? Every company must ask itself these hard questions. If the answers are positive, and the company is willing to pursue the objective, scientific truth about its marketing efforts, then marketing mix modeling can lead to sustained, long-term sales growth and improved profitability.

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