Marketing Optimization for Maximum ROI

by Laura Patterson, VisionEdge Marketing President

Optimization means "the action of finding the best solution." Mathematical programming, or optimization modeling, is a branch of mathematical modeling that is concerned with finding the optimal solution to a problem.

Initially, optimization was used as a way to mathematically determine the optimal allocation of scarce resources. The concept has been borrowed by businesspeople to aid decision-making.

Optimization has been used in the areas of the manufacturing supply chain, airline revenue yields, and financial investment risk assessment. More recently, the concept is being adopted by marketing.

You've probably heard phrases such as site optimization, search engine optimization, event optimization, and campaign optimization. A more recent concept with broader application to marketing is the idea of marketing optimization.

Marketing optimization addresses determining the optimal subset of combinations that will maximize profit.

Marketing's primary responsibility to the organization is to generate profitable revenue growth. It would seem that maximizing profit is a relatively easy thing to do: just achieve the full profit potential for each and every customer. Easier said then done.

The sheer number of customers, products, and communication channels creates complexity, often making it difficult to find the right set of customer-product-channel combinations that will maximize profit while ensuring customer satisfaction.

At the same time, product life cycles are getting shorter, competition is fiercer, market fragmentation and the number of segments are greater, and change is accelerating, adding further complexity to making marketing decisions. Marketing optimization is designed to help address this level of complexity.

With the use of data and analytics, a company can develop marketing optimization processes and models that help determine which customers should be offered which product through which channel, and which purchases customers make via what channel that are the most profitable.

It can also help determine the maximum possible profitability of a multi-offer campaign and the optimal mix of offers to send each customer.

Deploying a mathematical method allows you to explore all the possible solutions and select the one that will achieve the best possible outcome while satisfying all of the constraints. This approach generally requires using linear programming. A common explanation for linear programming is when a problem can be expressed in the following form:

Maximize $\mathbf{c}^T\mathbf{x}$

Subject to $\mathbf{Ax} \leq \mathbf{b}$

Where $\mathbf{x} \geq \mathbf{0}$

x represents the variables to be determined, while **c** and **b** are known coefficients and **A** is a (known) matrix of coefficients. The expression to be maximized or minimized is called the objective function ($\mathbf{c}^T\mathbf{x}$ in this case). The equations $\mathbf{Ax} \leq \mathbf{b}$ are the constraints that specify a convex polyhedron over which the objective function is to be optimized.

A marketing example might be, "Given a customer C and an offer X, should I make the offer X to customer C?" It might be relatively easy to answer this question as long as the number of customers, offers, and channels are few; but the computations become very difficult when you have hundreds of variables and constraints.

You will also want to time as a variable into consideration when you build your model. Maximizing profit over what time frame is important. And while everyone will say "the long term," the reality of today's equity market may mitigate that solution in reality.

So what does it take to do marketing optimization? First, we need good data. We need data related to customer response, marketing costs, product margins, pricing levels, etc. Some of this data we can get from our CRM, SFA, ERP, financial systems. Other data may need to come from external sources or market research.

Second, we create the model and equations. The ideal is to convert the marketing management problem into a marketing programming problem. This model describes the relationships between the relevant variables in a quantitative way.

To solve a marketing programming problem, we need a model that describes the mechanism underlying the marketing problem or phenomenon, and an optimization algorithm that searches for the optimal values for the decision variables given the objective, such as profit maximization or 30% brand preference.

Don't worry if an objective ideal model that provides a valid description of the marketing phenomenon under study may not exist. Create the best model you can using all the relevant variables and the supposed cause-and-effect relationships between these variables.

Last, we systematically vary the inputs until optimization is achieved.

As you have surmised, the first hurdle is the data. Once you have the data, it may make sense to invest in an optimization software program that will help you develop the equations and apply the inputs, rather than trying to do this in a more manual way or with spreadsheets.

By using marketing optimization processes and tools, marketing professionals are able to develop and implement the optimal marketing mix for each target market and segment for their company's products and services.