A Marketer's Guide to Optimization

What is marketing optimization?

"Optimization" is a term frequently cited by marketers, academics, consultants and software vendors. In the context of marketing analytics, just what do they mean by "optimization"? Having been hands-on practitioners in all of the major approaches to "marketing optimization", ETS Marketing Science introduces a framework for selecting the approach that is right for you.

Broadly speaking, we can define "optimization" as "the act of rendering the most favorable or desirable outcome". We can further define "marketing optimization" as "the marketing process for maximizing a specified business outcome". However, the various practitioners of marketing analytics impart a great deal of confusion by differing, not only in the process for conducting marketing optimization, but in the outcome as well.

What do we optimize?

The designated outcome to be optimized can be an (1) **aggregate business result** such as revenue, profit, units sold, market share, new accounts, store traffic, and leads generated or some (2) **customer or prospect behavior** associated with purchase, retention, or cross-sell. A firm typically selects the outcome for optimization based on its prevailing strategic (brand or product level) or tactical (program or campaign level) goals. If, for instance, the firm's objective were to increase national market shares, then the firm's optimization efforts would focus on national market shares. Regardless, most firms can benefit from both approaches. (ETS offers a unique combined approach that optimizes customer response and aggregate business results simultaneously via the 4Optimizer^{TM} framework.)

A Customer Relationship Management (CRM) analytics firm focuses primarily on optimizing customer or prospect behavior. A Marketing Mix Modeling firm focuses primarily on optimizing an aggregate business result. Except for ETS Marketing Science, marketing analytics consulting firms typically focus primarily on either customer or aggregate business results, but not both. The disparate analytics expertise and data requirements make a dual focus, of both CRM and Marketing Mix Modeling analytics, hard to come by.

How do we optimize?

The "process" is defined by the specific sequence of steps needed achieve a specified outcome of marketing optimization. While the process includes operational steps such

as data warehousing, our discussion will focus primarily on the analytical steps. There are three primary categories by which optimization analytics can be classified (in the sequence of increasing sophistication):

1. **Iterative Response to Marketing Metrics** – Management react on an iterative basis to ongoing tracking, measurement and reporting of program level or corporate wide marketing performance.
2. **Statistical Predictive Modeling** – Statistical or mathematical models, based on historical marketing data and/or customer/prospect profiles, are used to predict (that is, forecast or simulate) specific customer behavior or business result.
3. **True Marketing Optimization** – Specialized mathematical algorithms (such as linear or nonlinear programming) are applied to the aforementioned Statistical Predictive Models to compute the specific budget allocation and/or customer treatment that would yield the highest (hence optimal) business result possible for a given constrained or unconstrained budget.

We should note that any of the three categories could be further classified as either customer behavior or aggregate business result focused. ETS Marketing Science places these categories in the **Marketing Optimization Continuum™ :**

Figure 1. The Marketing Optimization Continuum™

The Marketing Optimization Continuum™ can be thought of as an evolutionary continuum in the sense that a firm needs to master each step in succession in order to achieve True Marketing Optimization.

Marketing Metrics

What is often called marketing optimization is nothing more than an iterative marketing management process of reacting to latest available marketing performance metrics. **Systems integration and reporting solutions vendors most frequently define marketing optimization under this category.**

Despite the simplicity, the timely delivery of accurately compiled and intuitively transformed business data enhance the likelihood of effective management response. In addition, statistical predictive modeling, which is the next evolutionary step in marketing analytics sophistication, can be facilitated only if the firm has a firm grasp of its marketing data. The primary categories of analytics associated with "marketing metrics", in a likely sequence, include:

1. **Exploratory Data Analysis** – EDA is a well known statistical discipline used to formulate meaningful metrics from raw data or assess data quality. Statistical trending and data visualization also fall under the EDA umbrella. Data Integration and normalization strategies cannot be effectively formulated without this exploratory stage used to gain preliminary insights on data.

2. **Data Integration / Normalization** – Marketing data, which typically reside in disparate silos under different aggregations, need to be integrated into a central depository and normalized (transformed) into common scales before meaningful reports and tracking can be generated.

3. **Reporting and Tracking** – In conjunction with EDA, fully integrated and normalized data are summarized into the appropriate plots, chart, tables, or financial metrics to convey intuitive insights into marketing performance.

Predictive Modeling

Tracking, measurement, and reporting is a prerequisite to marketing optimization, but this iterative approach can only point to the right direction. Only occasionally does this approach come close to achieving true optimal allocation of marketing resources. The next evolutionary step in marketing optimization is Predictive Modeling based on historical marketing data and or customer/prospect profiles. These are statistical models in the sense that such models are largely associated with probabilities (of purchase for instance). We will discuss in detail the two primary types of predictive models – **Customer Targeting Models** and **Marketing Mix Models.**

Customer Targeting Models

Customer Targeting Models are used to isolate the profiles of the most profitable customers or prospects. Although targeting models are usually associated with individual marketing programs or campaigns at a tactical level, targeting models can also be used strategically when making broad customer policies. Examples of targeting models include:

1. **Response models** designed to assess the probabilities of achieving a desired customer response to specific marketing messages and offers
2. **Hazard models (survival analysis)** to predict when a customer is likely to exhibit a specified behavior such as attrition or repeat purchase
3. **Customer valuation (lifetime value) models** designed to estimate the lifetime financial values of individual customer relationships.

Customer Targeting Models are the prevalent types of models used under the Customer Relationship Management (CRM) umbrella.

Marketing Mix Models

Although Marketing Mix Modeling has been the subject of extensive academic research for several decades, it did not gain momentum commercially until the data processing technology advancements made in the late 80s. A Marketing Mix Model is a specialized form of econometrics model used to determine the contribution of individual marketing efforts to a given overall business result. For instance, a marketing mix model can determine the percentage contribution of the respective marketing activities including but not limited to advertising, promotion, pricing, direct marketing, public relations, competitor response, and economic variables to overall sales. The special appeal to Marketing Mix Modeling is that all of the relevant variables that affect a given business result are considered within a single model.

True Marketing Optimization

The aforementioned first two components of the Marketing Optimization Continuum™ do not constitute true optimization from ETS Marketing Science's point of view, though many other practitioners of marketing analytics will have you believe otherwise. These two components do, however, help management and analysts make better incremental decisions by gaining intelligence from insightful marketing metrics before building predictive models used to simulate or forecast business results for varying budget allocations, pricing, or offers to customers. These techniques do not, however, answer the following question:

"Exactly how much should I spend on each component of the marketing mix and what specific offers should I make to my customers so that our overall profits are maximized for the next fiscal year?"

True Marketing Optimization answers this question. From a mathematical point of view, the models built at the Predictive Modeling stage of the Marketing Optimization Continuum™ require additional mathematical algorithms to compute the optimal budget allocations or customer treatments. Without True Marketing Optimization analytics, the user of predictive models are restricted to simulating a limited range of scenarios, but could not possibly test all scenarios to discover the single scenario where a specified business result is maximized, that is, optimal.

ETS Marketing Science's Perspectives on Marketing Optimization

In summary, marketing optimization can have different meanings to different practitioners. It is important to establish the business outcome that we wish to optimize and the specific analytics used to optimize that outcome. All marketing optimization techniques aim to achieve better outcomes, but True Marketing Optimization can only be achieved when we discover the one scenario that yields the maximum (optimal) outcome. Let us recall that we defined "marketing optimization" as "the marketing process for maximizing a specified business outcome".

ETS Marketing Science recognizes that evolutionary steps are needed to achieve True Marketing Optimization. These steps are summarized in the Marketing Optimization Continuum™. The marketing data must first be harnessed, analyzed and transformed into intelligence generating Marketing Metrics. This is a prerequisite to building predictive models that enable simulations and forecasting from specific scenarios. Mathematical optimization algorithms are then applied against the Predictive Models in order to discover the single optimal scenario, thus achieving True Marketing Optimization.

We hope this white paper has demystified much of the chatter about marketing optimization and has offered a viable framework for reaching True Marketing Optimization. ETS marketing Science is in a unique position of having the experience and expertise in all of the aforementioned analytical capabilities described along the Marketing Optimization Continuum™. *ETS can help you evolve along the Marketing Optimization Continuum™.*

About ETS Marketing Science

ETS Marketing Science is dedicated to helping marketers optimize their Return on Marketing Investment (ROMI) across the entire marketing mix and across all customer segments.

ETS develops marketing analytics and decision support solutions for clients across a broad spectrum of industries including financial services, automotive, and consumer packaged goods.

ETS distinguishes itself by providing, not only a full suite of marketing analytics capabilities, but also a true marketing optimization framework through our integrated 4Optimizer™ solution, unifying the four most sought after components of marketing optimization under a single integrated framework:

1. **Customer Relationship Management** (targeting, valuing, acquiring, growing, and retaining profitable customers)
2. **Marketing Mix Modeling** (measuring, forecasting and optimizing the contribution of the media mix, pricing, and promotion to sales)
3. **Brand Equity Tracking and Optimization** (using traditional survey based or proprietary non-survey based methods)
4. **New Product Sales Forecasting** (using proprietary extensions to Marketing Mix Modeling)

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