

# What Is Optimization?

## What is optimization, anyway?

What does it mean to say we “optimize” online marketing? To many, it connotes some sort of “improvement”, but it is far more than a fancy word for “improvement”. “Improvement” is a linear, single step in making something better, while “optimization” is a mathematically rigorous evaluation of the full range of practical options leading to the selection of the best available choice.

Here is a good example: Painting a house is not the same as optimizing its resale value (though it helps). If no attempt is made to evaluate the full range of alternatives for spending the time and effort on the house, you’re merely improving (without “optimizing”) the price your house will bring.

## What Are We Optimizing?

We need to define an optimization objective in terms of something measurable. An *objective function* describes this goal mathematically, in terms of the factors we can vary or control. With the objective function defined, optimization is the maximization or minimization of that function. In plainer English: we are either trying to capture as much of something good as we can or avoiding something painful or costly as much as we can.

What success metric are we trying to optimize in online marketing? Here are some candidates (there are many others):

- *Clicks*
- *Page views*
- *Revenue*
- *eCPM - effective cost per acquisition*
- *VPM - value produced per thousand impressions*
- *Ad revenue*
- *Incremental profit from up-selling or cross-selling existing customers*
- *Member involvement (uploads, responses, postings, etc.)*

Optimization is a technique for making decisions involving complex trade-offs. In deciding how and where to apply it, it is useful to think of it as a way of converting on latent demand, demand that is hidden or hampered by:

- *wide variation in your audiences’ product knowledge, needs, desires, or cultures*
- *too large a number of products/offers to display all at once*
- *offer eligibility rules, localized versions*
- *geographically-driven pricing*

If you only have three or four seconds of a customer’s attention, then it is critical to show them the right offer when you get an opportunity. To optimize this interaction, you really need to have:

- *A range of products/offers that are materially different*
- *An audience containing subgroups that differ in terms of what they need and what they respond to*

## It Takes Data to Optimize (and Scale and Time)

A statistically rigorous approach to optimization is inappropriate for cases where:

- The desired outcome is too infrequent to provide enough history to model
- There are no measurements of the predictors or factors that drive the outcome
- The campaign will not be consistent or stable for long enough to apply learnings

Real optimization requires the collection of sufficient history to support statistically valid conclusions linking what you can control to what you want to happen. Anything less is merely a hopeful stab at improvement.

## Constraints: the Sky is NOT the Limit

We can't always unleash optimization on a simple objective function and get a practical result. Real-world optimization problems frequently involve constraints that need to be included in how we set up our objective. Some examples: limited budgets, multiple product marketing teams that expect their offers to get equal time and space, offers that are mutually exclusive, products that should never be presented together, or products that should always be presented together.

## Tracking and Measurement: What's My Lift? Where Are My Millions of Dollars?

To measure the effectiveness of an optimization program, you need to compare the performance of your optimized program to a relevant reference point. You might be tempted to simply compare pre-optimization performance to optimization performance, but you are taking a huge chance if you do: you could wind up mistaking the natural variations or seasonal ups and downs in your business for the effects of your program. This is a common optimization rookie error – don't do it. Some better options would be:

- *Run a portion of your impressions to serve as a random control*
- *Run a portion of your impressions according to your pre-optimized targeting rules to serve as a "Business As Usual" reference point*
- *Run your best-performing creative/offer/product to serve as a "Current Champion" reference point*

## Conclusion

Optimization is a powerful tool for improving the performance of your online marketing programs. It is not magic - like anything really useful, it requires some commitment. It also doesn't work for all programs – you need scale, offer choice, a heterogeneous audience, and a measurable objective. The good news: it gets easier as you master it, and it really works.



## ABOUT [x+1] INC.

New York-based [x+1] ([www.xplusone.com](http://www.xplusone.com)) provides a continuous optimization solution that equips online marketers with real-time, automated decision making that lifts ad and site conversion rates. This simplifies their online marketing and achieves greater return on their overall marketing investment.

[x+1]'s market-leading solutions, *site+1* and *media+1*, empower marketers with instant insights derived from complex data. These solutions are powered by our groundbreaking technology: the Progressive Optimization Engine™ (POE). Leading companies in financial services, telecommunications, on-line services, and automotive industries have significantly increased message accuracy, customer response and ROI with [x+1].

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