

Teaming MAN & MACHINE to Optimize

BY STEVE SASHIHARA

In today's fiercely competitive world, the notions of long-term strategy and enduring competitive advantage seem like quaint anachronisms; part of the detritus of the 1980s and 1990s. Now, "strategy on the run" and tactical advantage rule the day.

McDonald's, Walmart, Marriott, Google, UPS, Amazon, and many others have demonstrated that competitive advantage comes from tight focus and riveting attention on making optimal decisions that squeeze every ounce of value from the assets under management. They and other industry leaders have one thing in common: they use optimization to make those critical choices.

Optimization is a decision-making process and a set of related tools that employ mathematics, algorithms, and computer software not only to sort and organize data, but to use that data to make recommendations faster and better than humans can.

Optimization has been around, in various forms, for some time. Originally growing out of a discipline labeled "Operations Research," or OR, it began as an academic discipline and then became a key factor in the Allied victory in World War II. After the war, optimization was deployed to help manage large-scale, asset-intensive operations such as oil refineries, power plants, and the U.S. space program. As the availability, speed, and capacity of computers increased in the last decades of the 20th century, optimized decision making started to move from the public to the private sector and was increasingly adopted by both larger and smaller enterprises in a variety of industries.

Now, more than a decade into the 21st century, optimization has clearly proved its worth in a wide spectrum of applications. Yet, while the number of businesses that are using optimization to improve their problem solving and decision making has risen, these forward-thinkers are still in the minority. Optimization could make a far greater contribution to improving the way today's organizations are led and managed—if only it were given a chance. Which begs the question: Why hasn't it?

One of the major barriers to wider adoption of optimization is the new and unique type of teamwork it requires, both among humans and between humans and machines. In the Digital Age, employees must learn to collaborate not just with one another, but with computers.

OPTIMIZING SALES

Few functions are bound so tightly to business success as sales, and it was one of optimization's early areas of focus. Almost 75 years ago, American mathematician Merrill Flood popularized one of the most celebrated combinatorial optimization problems: the traveling salesman. The problem involves trying to determine the most efficient route for a salesperson to take in visiting a series of cities, without passing through the same city twice. Following this early interest in a sales problem, one might have expected sales departments to be early adopters of optimization techniques. Yet optimization is still not widely employed by salespeople.

This oversight has profound repercussions. The exact number of salespeople in the United States is difficult to determine. Most estimates place the number somewhere above 15 million. Imagine how much more revenue they could generate if, instead of having rah-rah motivational meetings and stale training programs, their managers had provided them with the tools to optimize their sales calls!

WHERE IT IS WORKING

Fortunately, optimization is gaining a foothold. Several pharmaceutical companies have begun using it to instruct their salespeople which drugs to highlight during their hard-won face time with physicians. The recommendations are based on such things as the doctor's prescription history, medical group affiliation, and geographical location.

At UPS, sales reps use advanced analytics software that uses a sophisticated algorithm to alert the salesforce when a customer is likely to switch to another shipping company. A UPS sales representative is sent out immediately and often shows up at a customer's door to resolve a potential problem before the customer even realizes that the problem exists.

For several years, NBC has been using optimization software to set prices and draft proposals for the sale of advertisements for its fall lineup. The software balances client requests with the network's sales objectives, taking into account such constraints as client budget, targeted demographic groups, desired program mix, and desired ad length. The software has reduced proposal-preparation time from days to less than an hour, while doing a much better job of meeting client requests. Perhaps most significant, because of the optimality of the software's plans and the reduction of errors, the reworking of proposals has been reduced by 80% , saving both the salesforce and clients untold hours of unproductive effort. NBC credits the proposal software with generating an additional \$200 million in sales over a four-year period.

Such examples are encouraging, but much more can be done. Today's sales environment is far more sophisticated than it was in the good old days, when "a shoeshine and a smile" were keys to successful selling. Sales has become a team sport—and a global one at that. Optimization can and should be more strategically deployed to provide a competitive edge at every step in the entire sales process, from data capture and analysis to time and territory management to prospect contact.

COLLABORATION 21ST-CENTURY STYLE

Given the plummeting costs of computing power, together with the proven success of optimization, one might ask, "Why hasn't optimization been more widely adopted?" There are several reasons, although certainly one of the most central is the fact that successful optimization demands new kinds of interdisciplinary collaboration and teamwork. Optimization touches not simply the redesign of work processes, but one of the most central cultural tenets of any organization: How decisions are made about the allocation of scarce resources. Not only is this an area of extreme interfunctional stress, it is typically the bailiwick of top executives—a group typically not shy about its decision-making prowess. And even the most progressive organizations harbor hidden pockets of neo-Luddite technophobia. The ongoing and unrelenting introduction of new technology—computers, robots, and optimization—inevitably causes workplace stress, fear of job loss, and an assault on one's view of self-worth.

OPTIMIZE OR ELSE

There are a number of reasons to believe that optimization is finally on the cusp of explosive growth. Perhaps the most powerful force likely to accelerate the use of optimization software is competitive pressure. Three decades ago, when American Airlines adopted yield management software, it was a pioneer in its industry. At that point, optimization represented a competitive differentiator for American Airlines; today, it is a requirement for entry into the commercial airline industry. As optimization penetrates new industries and we learn to extend collaboration to the human/machine interface, early adopters will be capable of making better, faster, and more optimal decisions about how to deploy their assets. Other industry players will need to follow suit: keep up and compete—or perish. *MW*

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