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A better way to price

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Why was your airplane overbooked? How come the price for a hotel room changes from day to day and how do car-rental companies know how many cars to have at any given airport? These questions and more can be answered by looking at the management science tools used by some businesses to manage revenue, costs and capacity utilization. In this, the third of a four-part series, FP Executive examines the basics of management science.

For many companies, cost alone drives their product pricing strategies. Managers attach value to the end product and too often leave money on the table in the process. Management science can change that.

"At its core," says Wade Cook, Gordon Charlton Shaw professor of management at the Schulich School of Business, management science is "a collection of mathematical tools and concepts used in industry to improve operations, efficiency and profitability. While management science has been part of the business landscape for the past 30 to 40 years, it has only recently been applied to optimize price.

"It's still early days for management science and pricing largely because there wasn't the data available to do it," says Paul Hunt, president of pricing specialist **Pricing Solutions**, which has been focused on pricing optimization in the business-to-consumer and business-to-business space for more than 15 years.

"Industry leaders are well into it now, but those companies that lag behind are leaving money on the table, and sometimes they are leaving money and volume because they are not pricing themselves appropriately for the market. Management science can often allow you to restructure your pricing and grow margin and grow volume at the same time."

Mr. Hunt estimates that about 60% of businesses use cost-based pricing. "They are focused internally on what their costs are and then adding on a margin they consider acceptable. It's the opposite of what we would call value-based pricing, which is pricing from the perspective of the customer."

There are two ways to do that: by analyzing existing data or by conducting consumer research. "We will utilize one or the other to build predictive programs."

The former involves leveraging historical sales data to understand the psychological thresholds of price points. "We often analyze how much volume a company is selling at different price levels and organize price tests to determine optimal price," Mr. Hunt says.

On the research side, **Pricing Solutions** has adapted and modified a management science methodology known as Conjoint (Consider Jointly) Analysis. Essentially, Conjoint Analysis is about creating simulated shopping experiences for customers. "You can use it in any industry and what you are trying to do is recreate a buying decision. We present customers with very realistic alternatives based on how they would go about making a buying decision in the marketplace and then we can start burying the variables in the buying decision."

For example, **Pricing Solutions** conducted a study for a client in the frozen food industry interested in optimizing the pricing of its product line. "There were new competitors in the marketplace and our client wasn't sure if they should adjust prices or stay where were they were," Mr. Hunt says. "Their historical method of adjusting prices was to do it on a product line basis. That meant they would say something like, 'OK, we are going to increase prices this year by 5% across the line.' They had 120 different SKUs and they would typically see their profits improve but they would lose volume. Still, it was easy to execute and get the sales force to understand it."

Pricing Solutions was brought in and using Conjoint Analysis created simulated shopping experiences over the Internet. "The [computer] screen is the real estate we have to do the studies, so we have to be very efficient with it," Mr. Hunt says. "We walked consumers through a series of questions: 'When you buy frozen foods, what brands are you aware of, do you consider, have you purchased?'

"We customized the screen for each individual survey respondent and showed them the products relevant to them as well as our client's products. Of course, they had to be open to consider our client's products."

With that starting point, **Pricing Solutions** varied pricing across the product lines for its client and its competitors, too. "The price changes were within ranges established by the client and as we changed prices, we were also moving the product around the screen and put the consumer through a series of decisions based on different circumstances [think promotions, etc.] They went through this process about 12 times and then we built individual elasticity curves per respondent, took that information and created a segmentation model based on behaviour for different types of buyers."

With all that information in hand, **Pricing Solutions** then built an optimization model and ran 30,000 iterations, optimizing price for margin before moving on to add constraints: optimize margin but don't change prices by more than 10%; optimize margin but don't lose more than 2% in volume, and so on. "At the end of this process, we put in the approach the client was going to take, which was to adjust prices by 5% across the line, and the model predicted they would gain $2-million in margin and lose about 500,000 units in volume. By applying the optimization model, we were able to grow profits by $4-million while losing only 150,000 units in volume. So we doubled profits and reduced lost volume by 350,000 units. They have executed on that model and the results are within 1% to 2% of what the model predicted."

WHO PROFITS FROM MANAGEMENT SCIENCE

AIRLINES

- Airlines have used it to optimize seat sales. American Airlines is a leader in this field.

RETAILERS

- Retailers use it to manage inventory and pricing. Wal-Mart is a retail leader in this.

BASEBALL TEAMS

- Baseball teams, including the Boston Red Sox, have used management science to pick winning players.