ORACLE®

Retail Science Guide: Machine Learning & Targeted Offers

Using Machine Learning to Spot Influential Customers and Optimize Offers

A Collaboration with MIT Sloan School of Management and Oracle Retail Science Researchers

< HOME >

If a retailer makes a targeted offer to one group, causing them to buy more, or earlier in the cycle, will that in turn influence others to buy, even at full price? **A collaboration between Oracle Retail Science and MIT Sloan School of Management** researchers use machine learning, and counter-intuitive promotions, to **improve profitability more than nine percent**.

ORACLE®

INTRODUCTION

Sometimes what retailers **think** should work, produces unexpected results. That is what Oracle Retail and MIT researchers found using machine learning to identify and understand influential relationships between early adopters and later buyers of a product. The study is the latest in a long-standing collaboration between Oracle Retail Science and the Massachusetts Institute of Technology, Sloan School of Management researchers.

"In marketing, we used to talk about the four Ps—product, place, price, and promotion. Now there is a fifth P: personalization."

– Professor, Dr. Georgia Perakis,
MIT Sloan School of Management

Personalization

promotion

product   place

price

In a live webcast and subsequent standing-room-only session at Oracle Industry Connect, MIT lead researcher Dr. Georgia Perakis described how in the absence of costly third-party data (i.e., social) retail can leverage existing point-of-service (POS) data to understand the influence of a particular store on other stores, and effectively predict the course of future store performance. What's more, with the right targeting and promotions, retailers can drive faster trend adoption rates and sell through by focusing promotions on trendsetter stores and limiting the need to offer discounts to customers who are influenced by them.

Needed: Automated Tools

Calculating the lifecycle of a product in terms of price, Dr. Perakis noted, is extremely important to retailers' profitability. It's also a tough challenge: discount too soon, and you leave a lot of money on the table. Discount too late, and you end up eating a lot of merchandise.

There is also the key question of targeted offers. **If you can isolate trendsetters in your loyalty data and drive them to buy more, or earlier in the cycle, will that in turn influence others to buy, even at full price?** That's the theory behind social-media marketing, which in many cases has proved effective.

< HOME >

But again, deciding when to discount, how much, and for which group of customers—everybody? Big shoppers? Small shoppers?—is critical. It's also extremely complex. If you're dealing with, say, 250 SKUs and looking at prices within the 20% range across one quarter, you have about 65,000 decisions to make. You can make them most effectively, says the MIT/Oracle Retail Science team, with the help of machine-learning analytics.

WITH **250 SKUS** AND LOOKING AT PRICES WITHIN THE **20% RANGE** ACROSS ONE QUARTER, YOU HAVE ABOUT **65,000 DECISIONS TO MAKE**

"In my opinion, you cannot do this off the top of your head, or with a spreadsheet. You need a tool. This tool will not be replacing you or your expertise—but it will help you make better decisions."

—Professor, Dr. Georgia Perakis, MIT Sloan School of Management

Not Needed: Someone Else's Data

A basic assumption underlying the experiment conducted by Dr. Perakis and her students is that it is not necessary to use social media data and have to deal with the attendant cost and privacy issues. With the proper tools, she said, retailers can obtain the needed level of predictive accuracy by analyzing transactional data they already own.

< HOME >

ORACLE®

"We began the work wanting to have access to the social network of the customers, but it was too expensive to be worth acquiring the data. So we asked ourselves, what can we do with the data we have? I always tell my students, if a door closes, look for a window that is open. That's what happened here. Retail POS and loyalty data can provide significant insights with the right predictive model."

—Professor, Dr. Georgia Perakis, MIT Sloan School of Management

< HOME >

The primary source of this data is the retailer's own transaction data, on- or offline.

If you're an online retailer, you know how much your online customer spends with you, and on what. You know what goes on her wish lists. And—an essential piece of information—you know not only what she tends to buy, but how early in the product's lifecycle she tends to buy it. Similarly, if you are looking to drive results on a broader scale—let's say for a cluster of stores or even a particular store—you could use POS data to derive similar insights.

Affluence, Early Buying, and Geography All Matter

The basic idea Dr. Perakis and her students came up with—the open window—is that retailers have hidden celebrities in their customer data, they just need to know where to look. Anecdotally speaking, from being part of the general public: we see a cool product in an ad, then we see someone who looks cool in it on the street, then we go buy one.

The MIT/Oracle Retail Science team's assumption was—and is—that a similar dynamic works in smaller slices of the population. In women who shop at a particular store, for instance, and who buy similar products, there is a subgroup who tends to buy early in the product lifecycle, and others who buy later. Then there are others who buy later still.

THE QUESTION IS:

*If you **accelerated the pace of the early buyers** of a given item—by, say, offering them a discount—could you speed up group two? And would that in turn speed up groups three and four behind them? And thus **create overall better sell-through and margin** for the item?*

< HOME >

"No one is suggesting that there's any magic at work here; people who don't know each other don't know each other. But with enough data, and the necessary analytical tools, statistical correlations between one group and another can be established and used as the basis for profitable, successful, repeatable promotions."

—Professor, Dr. Georgia Perakis,
MIT Sloan School of Management

Methodology

The team analyzed the following customer behavior of a fashion retailer:

10,000
customers in the retailer's loyalty program

Over **2 1/2** Years

Bought **4,000**
men's tops in 20 stores and online

The customers were divided into 4 groups:

1. high spender/early

2. medium spender/early

3. medium spender/late

4. low spender

The Power of AI and Machine Learning

Working with a Tier 1 fashion retailer, Dr. Perakis and her team gave it a try. Then they compared the results with results of the retailer's own strategy, nationwide, for the same products.

The theory being tested was this: **first, was there a relationship between one group's purchases of a given item and those of another?** Was it possible, in other words, to regard one group as an "influencer" of another, even though they didn't know each other and lived in different places? Second, would it be possible, by making very targeted offers to the influencers—the first movers, as it were—to accelerate the buying behavior of the later purchasers?

As part of the test, the Oracle Retail and MIT research collaboration generated suggestions for promotions—targets, timing, and degree of discount, and compared them to the retailer's own promotion/discount program. Some of the machine-learning-generated targeted offers were distinctly counter-intuitive, and overall, the suggested campaign was very different from the retailer's strategy.

Ultimately, the machine-learning-generated offer was **9.4% more profitable** than the national program.

< HOME >

KEY TAKE-AWAYS:

1. **Targeted promotions, shaped and informed by machine learning, may turn conventional wisdom on its head.** For example, providing sale opportunities to early adopters at the beginning of a product lifecycle can help to boost overall profitability of an item.

2. **It is possible to learn more from the information a retailer already owns, without purchasing third-party data.** Oracle Retail Science and MIT Sloan School of Management researchers found that retailers can obtain the needed level of predictive accuracy by analyzing transactional data they already own with the right tools and approach.

3. **Using machine learning and new analytical tools, retailers can improve results.** Far from the day of spreadsheets, retail science enables retailers to draw statistical correlations between customer groups and establish the basis for more profitable, successful, and repeatable promotions.

ORACLE®

Use Your Most Powerful Asset - Your Data

This research illustrates that retailers can not only stay in front of the effects of social, but also shape the magnitude and velocity of these effects – all with the information they already have at their disposal. "Your data is your most powerful asset," says DJ O'Neil, Solutions Manager for Oracle Retail Planning and Optimization. "For retailers that use their data to shape demand, social data becomes an indicator of effectiveness. Retailers looking to social data first will always be reacting and late to the game in which smart competitors (i.e. those using their own data) get to make up the rules."

Join a Research Focus Group

The Oracle Retail Science team is conducting research in other subjects as well. Areas in which the tools have been or are being developed include markdown promotion and offer optimization, returns optimization/ store inventory rebalancing, social analytics and fraud detection. Oracle Retail strongly encourages retailers to participate in—and benefit from—these activities, whether as partners in the tool development such as discussed here or as collaborative participants in the Oracle Retail Science focus group. Contact us today to join the group.

"Retailers looking to social data first will always be reacting and late to the game in which smart competitors get to make up the rules."

—DJ O'Neil, Solutions Manager for Oracle Retail Planning and Optimization

---

Customers Who Read This Article Also Viewed

On-demand Webcast: Spotting Influential Customers for Offers with Machine Learning

Ebook: Innovation in Retail: Machine Learning

Blog: Case Study - Machine Learning Increases Revenue for Flash Sale Retailer By 22%

Blog: R374IL 4N4LY71C5: Transforming the Retail Enterprise

Blog: Accelerating Advanced Analytic Strategies with Retail Science

< HOME >

ABOUT ORACLE RETAIL

Oracle provides retailers with a complete, open and integrated suite of business applications, server and storage solutions that are engineered to work together to optimize every aspect of their businesses. Twenty of the top 20 retailers worldwide—including fashion, hardlines, grocery and specialty retailers—use Oracle solutions to drive performance, deliver critical insights and fuel growth across traditional, mobile and commerce channels. For more information, visit http://www.oracle.com/goto/retail.

+1.650.506.7000

August 2018

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Find your local Oracle contact number here:
http://www.oracle.com/us/corporate/contact/global-070511.html

Oracle.com/Retail

Oracle is committed to developing practices and products that help protect the environment