Chapters to Go

The New Science of Retailing: How Analytics Are Transforming the Supply Chain and Improving Performance

by Marshall Fisher and Ananth Raman

Harvard Business Press. (c) 2010. Copying Prohibited.

---

books24x7

Introduction

Two forces have combined over the last fifty years to cripple the retail sector's once remarkably customer-responsive system. Consolidation has led to chains of hundreds, even thousands, of stores where merchandisers can rarely observe customers and glean the firsthand insights on their likes and dislikes that were available to the mom-and-pop operations that once populated Main Streets and city centers. On top of this, global sourcing has created supply chains that stretch across oceans and time zones. These chains save money, connecting stores to the cheapest suppliers, but those gains come at the expense of longer lead times—often half a year for products sourced in Asia. Having to wait so long precludes nimble reactions to customer demand. It often forces retailers to make single purchases for their entire seasons and hope that they have bought what will sell.

Buyers lack the clairvoyance to operate effectively within this system. They're human, after all. Since the two of us began consulting with retailers in the mid-1990s, we've heard executives lament poor performance by their buyers. Jerome Fisher, founder and former chairman of Nine West shoes, is someone who helped us enormously as we sought to understand the sometimes quirky world of fashion retailing. His complaint was typical of what we heard: "Line up ten new shoes and ten buyers and ask them which one will be the hot shoe next season, and you get ten answers." Similarly, the president of a department store chain remarked, "No buyer I know can walk into a showroom, look at ten styles, and pick the winner." Finally, Michael Weiss, CEO of Express and former vice-chairman of Limited Brands, suggests that retail buying resembles baseball. "In baseball, if you consistently bat 300, you make the Hall of Fame. Buying is the same. Get it right 30 percent of the time, and you're a Hall of Famer." [1]

One of our earliest consulting clients was a seller of bargain-priced women's clothing. It sourced in Asia and had to buy most of its goods at the start of the season, based on little more than guesswork. Its customers tended to be poor, overweight, middle-aged women. But its buyers, as is typical in the fashion industry, were slim, affluent thirty-somethings. The buyers, who hailed from urban locales like New York and Los Angeles, had little chance to mingle with the customers in far-flung places like Corpus Christi, Texas, and Sheboygan, Wisconsin. Getting the buyers to understand the customers was so tough that, on a store visit, the executive vice president of merchandising turned to a group of buyers, pointed to a man unloading a truck at the back of the store, and said, "See that guy over there? His wife is your customer. Don't forget it."

Executives at a grocery chain likewise told us that their buyers were so much wealthier than their customers that the buyers had trouble making sensible purchasing decisions. The managers thus posted signs in the buying offices saying, "Remember, you're buying it to sell, not to use." They also required that their buyers live for one week a year on a typical customer's food budget. That way, the buyers could appreciate the trade-offs that customers faced daily.

Given stories like this, you won't be surprised to hear that a discrepancy has arisen today between what retailers stock and what their customers want. You've probably noticed it yourself when shopping. Have you ever visited a store and found piles of marked-down merchandise but not the one item you went to buy? That kind of frustration is the norm. Data from the National Retail Federation shows that retailers accumulate so much excess inventory, that, as shown in figure I-1, markdowns have increased from 8 percent in 1970 to nearly 30 percent in the 1990s. Despite this glut of merchandise, consumers aren't finding what they want. Of the 70 percent of respondents to Kurt Salmon Associates' (KSA's) Consumer Outlook Survey who said they'd entered a store with a clear idea of what they wished to buy, half of them left empty-handed because they couldn't find it. In-stock rate was listed as the biggest factor influencing store choice for respondents.

Dept. store markdowns as a % of sales 1970–1997
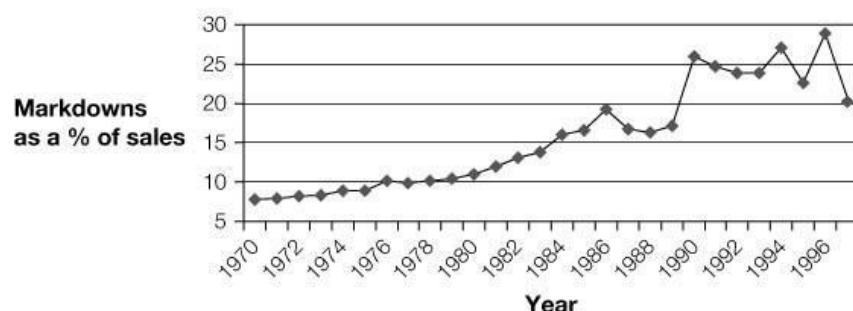
Note: After 1997 the NRF stopped reporting department store markdowns.
Source: Data from National Retail Federation, Financial and Operating Results.

FIGURE I-1: Markdowns have soared. *Note:* After 1997 the NRF stopped reporting department store markdowns. *Source:* Data from *National Retail Federation, Financial and Operating Results.*

But the good news is that even small improvements in matching supply with demand can literally double a retailer's profit. Retailers start with high gross margins, but very little of that margin flows to the bottom line. That's because retailers have high fixed costs: outfitting, provisioning, and staffing a store is expensive, whether the location reaps $1 or $100 million in sales.

For example, during 2000 to 2006, publically traded jewelry retailers had average gross margins of 42 percent, but net profits of only 1 percent. [2] Suppose a jeweler can increase its in-stock rate from 90 percent to 93 percent through more accurate forecasts and better inventory management—a realistic goal—and thereby increase sales by 3 percent. The gross margin on those incremental sales equals 1.26 percent of revenue (0.42 × 3%). All of this incremental gross margin would probably drop to the bottom line. The additional sales thus would increase profits—currently 1 percent of revenue—by more than 100 percent. Retail segments with smaller gross margins relative to sales would see a smaller—but still hefty—increase in profit from a 3 percent rise in in-stock rate. Improving the match between supply and demand has huge leverage because it costs no more to produce and transport goods that customers want than ones that they don't want. Yet the former sells at full price, and the latter, at perhaps fifty cents on the dollar. That can be the difference between bounty and bankruptcy.

You'd think that the consumer transaction data that nearly everyone in retailing collects would help to solve the problem of matching supply and demand. Technologies such as point-of-sale (POS) scanners, customer loyalty cards, and Web site cookies should enable retailers to understand their customers as well as the best mom-and-pop stores did.

Yet retailers have barely begun to mine the data that these technologies produce. Another of our clients, a vice president of merchandise technology at a department store chain, had a sign on her office wall that summarized the situation: "We are awash in data and starved for information."

Many retailers face this plight. They're drowning in numbers but lacking in insight. Witness our analysis of a clothier. We uncovered a surprising variety in the mix of sizes sold in its different stores. This was an obvious opportunity to improve purchasing and assortment selection. In the past, the chain had sent the same mix of sizes of all products to all of its stores. Thus some locations had many small sizes left over at the end of a season, while others had mostly large sizes left. When we reported our findings to the vice president of planning, he said, "Our buyers already have access to those patterns." He then dropped an eight-inch-thick computer printout on his desk. "It's all in my weekly size-selling report." The document gave a welter of sales data, broken down by size, style, color, and store.

With a little nudging, he acknowledged that the buyers had neither the time nor the inclination to pore over a thick computer printout. Even if they set aside the time occasionally, a single week's sales wouldn't give them enough information to detect patterns. A typical retailer might carry 10,000 SKUs at 500 stores, so a weekly report could contain 5 million numbers. Studying it with any diligence would outstrip anyone's manual effort; doing so requires algorithms incorporated in software, and such tools have been slow in coming to retailing.

On top of this, retail goods change frequently, and many folks in the retailing industry don't understand how to extrapolate sales projections from the sales histories of products that they no longer carry, particularly trendy ones. The sign on the office wall of a vice president of planning captures this conundrum: "History's a mystery; trend's your friend." Put differently, conventional wisdom says that sales data on current styles is useful in guiding buying but the history of prior

ones is worthless.

Yet history can inform decision making when mined appropriately. While products turn over frequently, the parameters of consumer demand can endure for years, and sales histories can help you understand and estimate them. Among these stable parameters are seasonality, size mix, the types of products that sell best at given stores, price elasticity, and category growth trends.

Even using current sales to guide buying decisions vexes many retailers. You can't just buy more of what's selling well. For one thing, most products sell at a slow rate, so it's hard to spot trends. In a study of thirty-two retailers, we found that an average SKU sold about one unit per month per store. [3] Yes, there was variation; groceries were faster, and jewelry, slower. But for most categories, you can't forecast from store-SKU sales data, because the sales rate is so slow. To detect patterns, you must aggregate the data by grouping similar stores and SKUs.

Also, you can't just examine raw sales. You need to know the conditions under which those sales occurred. All retailers have a few important causal factors that influence sales. Price and product availability always matter. Weather and competitive activity often do, too—needless to say, retail sales dropped in New Orleans after Hurricane Katrina. To do a forecast, you must understand how each of these factors influenced your past sales, and you must make educated assumptions about how they'll affect future ones.

Retailers today find themselves teetering on a knife-edge ridge in slick-soled shoes. They have lost their old way of understanding their customers—through regular one-on-one interactions—but have not found a reliable new one. In this book, we offer an approach to understanding customers and planning inventory that's just as reliable as the hard-won wisdom of the best old-school retailers. And we share techniques that we've developed to assist forward-thinking retailers in facing their biggest challenge today: the transition from hunch-driven to data-driven buying. Make that transition, and you'll turn your inventory faster and mark down fewer goods. Put simply, you'll make more money.

Retailers trying to make this transition can draw inspiration from a similar movement that began in the late 1970s on Wall Street, when several forces converged to transform money management from art to science. At the time, powerful new software and hardware permitted the capture and storage of reams of data on security trades. Mathematical models enabled the analysis of that data so that it could guide investment decisions. And a new breed of employee—the so-called quants or rocket scientists—arrived, abandoning careers in academia, science, and engineering to join investment banks, brokerages, and hedge funds.

With the financial crisis of 2008 and early 2009, Wall Street has come in for some deserved derision. Certainly, some of the quants, along with legions of other staffers in investment banks and hedge funds, promised more than they could deliver. But the methods remain valid and powerful, even if egos inhibited their sensible use. Information technology and smart analysis can't abolish risk, nor can they guarantee success. But used properly, they can help you sort through scads of information and make well-informed projections. Think of them as a microscope to a biologist: they don't replace judgment, experience, or even common sense, but they can help you see more clearly.

It may seem a stretch to draw an analogy between Wall Street and Wal-Mart, but consider the similarities of the jobs of a money manager and a retail category manager. Both buy stocks—one of companies, the other of products—that they seek to resell at a profit. Both face the risk that they might sell their stocks at a loss, and both must react quickly to market signals.

We hope that the insights and stories that we share in this book will help anyone who works in retailing. But please understand that not every method will work in every company. Just as products have a life cycle, so do retailers. Rocket science approaches work best at particular points in a retailer's life.

As in any life, one of the most significant events in retailing is birth. Retailers match products with people, and a change in products, people's habits, or the technology for matching them affords the opportunity for a new type of retailer to be born. CompUSA began as an attempt to exploit a new product: the personal computer. Destination Maternity, with a 50 percent share of the maternity apparel market, started because more pregnant women were working at professional careers and couldn't find appropriate clothes. And Amazon.com aimed to exploit a new technology for matching people with products: the Internet.

A business adage says that out of chaos comes revenue; out of order comes profit. Success requires balancing the chaotic process of attracting customers to raise revenue with the order needed to derive profits from the resulting gush of sales. As every businessperson knows, without the discipline provided by systems, you can *grow* broke.

In their early years, most retailers focus on proving that their concept works and tweaking store designs. They're more

worried about basic execution than cutting-edge analysis. Once they refine their concept and store layout, they move to open stores as quickly as possible. They learn to live with the chaos that goes with revenue generation, and rocket science retailing is probably less useful to them at this time than it will be later in their lives. At some point, usually at about fifty stores, they start to worry about profitability and must inject order into the hurly-burly of their operations. Here, rocket science practices can make the difference between success and failure. They can, for example, help to determine which products to carry and how best to price them.

At this crossroads, a firm strives to add discipline without destroying the creativity that generates excitement and draws customers. Too little order translates to lost profits; too much means lost customers. The goal of rocket science retailing is to harness the best analytical techniques without disrupting the creativity that excites customers. Achieving this ideal combination of creativity and cunning requires a new way of thinking. In this book, we'll show you how to implement these ways of thinking at your company. We aim to make you smarter. We'll leave it up to you to preserve your creativity and excitement.

Chapter 1 sets the stage for our discussion, showing the links between intelligent inventory management and stock market valuation at retailers. As you'll see, Wall Street rewards companies that excel at managing their inventory, paying more for their stocks than those of competitors.

In chapter 2, we examine current practice in assortment planning and describe our experiences in helping two retailers—a convenience store chain and a tire seller—strengthen their assortment planning. In chapter 3, we provide tools to help you decide how much inventory of each product to carry in each of your stores at any point. We also show you a more profitable way of managing markdowns.

Chapter 4 describes how to create a supply chain that is flexible enough to respond to demand signals, so you can identify and exploit today's winning products rather than chasing yesterday's. Chapter 5 lays out an approach for better aligning incentives within your company and supply chain. New ways of doing business disrupt people's routines and make their usual ways of operating and thinking obsolete. Too often, corporate innovators defeat themselves by introducing new ideas, like rocket science retailing, without also introducing incentives for their adoption.

Chapter 6 addresses store-level execution, helping you to identify the reasons that determine whether a potential customer shops with you or a competitor. Retailers must know what matters to their customers. Offering Nordstrom-quality customer service won't help you if what your customers really want is Target-level prices.

Chapter 7 explores the ways in which information technology enables rocket science approaches, with a focus on radio frequency identification, or RFID. Accurate information is the lifeblood of rocket science retailing. You can't make good decisions if you don't have good data. Finally, chapter 8 starts with the premise that rocket science retailing requires more than just formulas. You also must have the right organizational structure and an implementation plan. You can't just flail about, assuming that a new software package and a few quants will deliver salvation. You have to know exactly what you want to achieve in your particular context and how you intend to get there.

[1]Unless otherwise indicated, all quotations from retailers are from discussions, interviews, or talks given at a class or conference with the authors.

[2]Source: S&P's Industrial Annual Database accessed through Wharton Research Data Services (WRDS).

[3]See Marshall L. Fisher, Ananth Raman, and Anna Sheen McClelland, "Rocket Science Retailing Is Almost Here: Are You Ready?" *Harvard Business Review* , July–August 2000, 115–124, for a more extensive description of this study.