



Leading Practices in Market Basket Analysis

*How Top Retailers are Using Market Basket Analysis
to Win Margin and Market Share*

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Executive Summary

Increasingly, retailing is becoming a high-performance sport, and like athletes, retailers are seeking a competitive edge through technology. Market basket analysis, also known as affinity analysis, has emerged as the next step in the evolution of retail merchandising and promotion. Market basket analysis allows leading retailers to quickly and easily look at the size, contents, and value of their customer's market basket to understand the patterns in how products are purchased together, or basic product affinities. Advanced implementations of market basket analysis leverage near-instant results to encourage "train-of-thought" or interactive analysis, enabling retailers to drill down into customer buying

Leading retailers are leveraging Market Basket Analysis to:

- Develop more profitable advertising and promotions
- Target offers more precisely
- Improve loyalty card promotions with longitudinal analysis
- Attract more traffic into stores
- Increase the size and value of the basket of purchases
- Test and learn by using the marketplace as a laboratory
- Empower planners and merchants to make smarter decisions
- Determine the "magic" price point for individual stores
- Match inventory to needs by customizing layouts, assortments, and pricing to the local demographic

patterns over time to precisely target and understand specific combinations of products, departments, brands, categories, and even time of day.

To understand how top retailers leverage market basket analysis in their business decisions, The FactPoint Group interviewed over 50 retailers with revenues from \$400 million to \$24 billion. What we found was that an overwhelming majority of retailers were familiar with market basket analysis and looking to expand their capabilities in that area. This research study reports on the best practices in market basket analysis.

With market basket analysis, leading retailers can drive more

profitable advertising and promotions, attract more customers, increase the value of the market basket, and much more. Buyers, planners, merchandisers, and store managers, are beginning to understand how this new generation of easy-to-use market basket analysis tools helps them work smarter and compete more successfully.

For Retailers, Every Week is the Olympics...

As the competition for the consumer's shrinking wallet intensifies, retailing is becoming like a high-performance sport where winning can depend on fractions of a second. For retailers, winning means out-selling and out-profiting

the competition. A 1% lift in sales, or 1/10th% improvement in margin, can tip the balance between success, survival, or failure. But below a retailer's top-line sales, success requires constant fine-tuning of the controls available to the retail disciplines, such as merchandise planning, buying, advertising, promotions, assortments, site selection, etc.

Retailers assume risk every time they make decisions around buying/replenishment, advertising/ promotions, and assortment planning. Surprisingly, these high dollar-value decisions are still frequently based on "gut feel" or "instincts." But the retail environment is changing as competition squeezes

margins. "Buying mistakes" have long been a fact of life for retailers. One leading retailer confessed, "What was OK before isn't anymore. It's easy to spend lots of money and make lots of mistakes- it used to be you bought 5000 SKUs and 2000 were right. Today, we have to pick right - buy 3000 and 2000 are right."

Too much or not enough. The age-old retail problem is stocking too much of the wrong merchandise and not enough of the right. The right merchandise moves and the wrong stuff sits

until it is marked down. The buyer's life is further complicated when he or she cannot obtain sufficient quantities of popular products, or when pressured by suppliers to buy uncomfortably large quantities of less popular products. These competitive and financial pressures motivate retailers to seek better tools that will improve their ability to manage through these situations.

Like star athletes, leading retailers look to technology to gain a competitive edge. Most retailers admit that they traditionally have been product-focused and know surprisingly little about their customers. Their desire for more insight into customer buying behavior has driven many to invest in business analytics solutions from vendors like Oracle, MicroStrategy, SAS, Cognos, Business Objects, and others.

Who Can Benefit from Market Basket Analysis?	
Roles	Interviewee Titles
Management	<ul style="list-style-type: none"> ▪ VP Merchandise Planning and Strategy ▪ VP Marketing Strategy and Finance ▪ SVP Planning, Allocation, and IT
Merchandising	<ul style="list-style-type: none"> ▪ Director of Business Analysis for Merchandising ▪ Director Database and Loyalty Marketing ▪ Senior Manager, Shopper Insights ▪ Manager Merchandise Planning
Store Operations	<ul style="list-style-type: none"> ▪ Director Store Operations ▪ VP Merchandising Systems
Advertising and Promotion	<ul style="list-style-type: none"> ▪ VP, Sales and Promotions ▪ VP, Brand Promotion ▪ Director, Promotional Advertising ▪ Director, Brand Advertising

In the 1990s, retailers were early implementers of POS systems and data warehouses for capturing and storing huge volumes of transaction data. But they soon realized that this transaction data only has value if it can be quickly interpreted, analyzed, and translated into action. Retailers crave more knowledge about customer buying behavior and are frustrated that the tremendous value trapped inside these POS and data warehouse systems is extremely difficult to access, requires lengthy lead times, and frequently involves the skills of a statistician or dedicated data analyst.

The main issue is that analytic solutions lack the speed and focus that today's retailers need to gain an edge. While powerful, these analytics systems focus on transactions, not the customer or their purchasing patterns. Existing tools cannot easily identify trends and anomalies in customer buying behavior. In addition, these tools remain expensive, time-consuming to deploy, and still require significant IT and application expertise, which we found to be mostly centralized, thin, or lacking.

The reports generated by existing tools are primarily performance summaries, great for understanding overall sales or same-store performance, but they don't help retailers finesse their assortments and promotions to attract and retain customers. The insufficiency of current analytics tools is why so many retail merchants continue to rely on Excel spreadsheets to accomplish their jobs.

Market Basket Analysis to the Rescue...

Market basket analysis (MBA) addresses many of the key challenges that retailers face today by answering a number of vexing questions. Leading retailers are learning to use MBA to make their businesses more predictable and profitable by identifying product affinities and attachment rates, even those that happen over time. These patterns in the transaction records reveal how customers buy, which is extremely variable across the retail spectrum, even on a small market basket size (a pharmacy with 3-5 items), or a larger basket size (a typical grocery store with 15-20 items).

In our research, we characterized two levels of market basket capabilities used by retailers:

Basic MBA allows retailers to look at the size and contents of a market basket and see basic product affinities, but does not allow for "*train-of-thought*" or interactive exploration of the data.

Advanced (or zoom-able) MBA offers more advanced capabilities to interact with the transaction data to discover patterns, affinities and associations. Interactive "*train-of-thought*" analysis is valuable because it helps retailers to work harder, smarter, and in real-time. *"As you look at the data you generate more analysis around*

anomalies (unexpected patterns).” Retailers want to be able to zoom-in to target precisely specific combinations of departments, stores, time periods, campaigns, or promotions, and then drill down by brand, category, time of day, or time period. Retailers also want to be able to view a customer’s market basket over time, taking into account multiple store visits or follow-on purchases. According to one interviewee, “There is no such thing as an ‘average market basket.’ MBA without drilldown has little value because retailers don’t want to optimize around an average situation that, in reality, doesn’t happen.”

Leading Practices in Market Basket Analysis

In our interviews we learned how retailers are using MBA to explore transaction data to determine the affinities of what people buy to detect changes in basket composition, size and value, and to discover new insights into their customer’s buying behavior.

- **More profitable advertising and promotions.** Retailers are using MBA to make advertising and promotions more predictable by understanding how buyers respond to different offers and communications vehicles. For example, MBA can help retailers avoid unnecessary discounts by understanding when and where discounts will make a difference to top line sales, knowing that a reduction in unnecessary markdowns will improve gross margins. Retailers also want to separate sales trends from the advertising effect to understand, *“Is our promotion just shifting revenue around or really uplifting gross sales? How did sales change and is this meaningful or not. What else was sold with what I advertised? What did I cannibalize?”* Furthermore, retailers want to understand what follow-on purchases a promotion might drive, such as an HDTV promotion that drives the purchase of high-margin DVRs and Blu-ray players over the next few months.
- **More precise targeting of offers improves ROI.** MBA is used to optimize campaigns and promotions for margins and sales uplift with more precise targeting. For example, increased precision in targeting offers results in higher redemption rates and allows retailers to win incremental spend by promoting the right product mix to the right customer at the right time. One retailer wanted to know, *“Can we get 90% of the benefit by more precisely sending 5 million vs. 10 million mailers and vary the offer across those mailers?”* Another stated that, *“A quarter-point improvement in redemption is the difference between solid ROI and a failed campaign.”*
- **Better loyalty card promotions with longitudinal analysis.** Longitudinal use of MBA allows retailers to characterize the buying behavior of customers over time, leveraging that knowledge for better understanding of their customer bases. Retailers use loyalty cards to capture customer lifecycle data so that they can analyze a customer’s lifetime purchasing behavior, such as shopping frequency or shifts in categories. For example, one toy retailer explained that it doesn’t make sense for it to sell video game machines (with very little margins) unless the customer also buys the

accessories and game software (with high margins). They use MBA against their loyalty card data to determine the overall margins on their video gaming sales and to create customer retention promotions to influence buyers to purchase follow-on games and accessories from them and not from another retailer.

- **Attract more traffic into store.** Retailers can better understand which products and offers will get customers into the store by correlating MBA with foot traffic counts, then attachment rates, to understand what they purchased once you got them in the store. *“The things you are giving away get them in, but what do they buy when they come in? What is the ‘attachment’ to the loss-leader?”* Once the retailer knows what brought a customer into the store, they can use MBA to understand how to keep that customer coming back.
- **Increase the size and value of the market basket.** With loyalty card data, retailers can see how many times the customer was in the store and the contents of their basket, then leveraging that knowledge with the goal of increasing the size of their basket. With MBA, they can identify and target promotions to customers who for example buy all their grocery needs except pet food, or who used to buy paper products but stopped.
- **Test and learn by using the marketplace as a laboratory.** Some retailers described how they use MBA to determine the value of an incremental marketing event at a select “*control group*” of stores, and then run the analysis at another “*test group*” of stores. For example, retailers described using MBA to determine how they can increase the average ticket value without having to spend more or sacrifice margin. They do this by separating the base sales trend from the “*advertising effect*” for the same timeframe.
- **Determine the “magic” price point for this store.** Today, using traditional business intelligence tools to optimize pricing can take two or three weeks. Retailers want to be able to use on-demand MBA to make these decisions in near real-time to answer questions like, *“What items did we raise the price of that consumers stopped buying?”* Another retailer described, *“We use MBA to maintain ‘pricing zones’ where we price one area different from another, e.g. if one of our stores is next to a Wal-Mart.”*
- **Match inventory to need by customizing store and assortment to trade area demographics.** MBA allows chain stores to enhance their “*core assortment*” by “*micro assorting*” products to tailor the assortment to the trade area demographics. Assortment can vary by climate, fashion, or demographics such as income, age, or urban vs. rural. *“We have 12 pharmacies near Wall Street that are much different than our suburban stores. What is the best assortment and pricing? Do we put in a self-serve coffee bar in those stores? What opportunities do we have?”*
- **Optimized store layout.** Retailers are also using MBA to improve space planning and visual merchandising for improved cross-selling and up sell. For example, are end-caps really driving more sales, and, if they are, are they also driving sales of complementary products?

How Market Basket Analysis Empowers Merchandisers

Merchandisers need to see trends longer-term to decide how much to buy and how the assortment fits into the business model. Here are some ways that leading retailers are empowering their merchandisers with MBA.

- **Empower the retail planners.** Retailers need better tools to help the planners and the merchants. *“Planning is one of the faster growing parts of the retail business. The intuition of the crusty old-school buyer is a myth because there is a lack of information. That’s why planning came to be; there didn’t used to be planners.”* A good planner asks, *“How much should we buy, how are we going to display, and what is the lifecycle of this product (one-time shot or carry it for three years)?”* It takes a partnership between the retail planners and the merchants to determine: Can we sell fast enough to cover carrying costs and will the initial markup provide sufficient margins to promote to sell through? These high-value, high-risk decisions can be significantly improved with the customer insights provided by MBA.
- **Empower the merchant (buyer) to buy smarter.** *“Buying mistakes”* are the #1 retail pain according to our interviews. MBA empowers merchants to buy smarter and strengthen their negotiating position with vendors by providing the merchants with better information about customer buying behavior. While some retailers prefer to restrict the use of MBA to the planners, retailers are increasingly experimenting with providing merchants with structured but easy-to-use MBA tools. Merchants focus primarily on buying inventory, assortment planning, and replenishment, but can also be involved with advertising, promotions, and markdowns. MBA can help improve replenishment decisions and provide improved understanding of seasonal demand.

Conclusion

Progressive retailers see MBA as a strategic tool that will help them increase their success and provide them with the edge that they need. By using market basket analysis, leading retailers are increasing their competitiveness by focusing directly on the customer’s buying habits, and then using that knowledge to quickly tailor their operations to the changing needs of their customers and trade areas. Additionally, leading retailers are beginning to equip buyers, merchandisers, planners, and store managers with powerful and convenient market basket analysis tools, improving success across the board.

“On-demand MBA is hugely valuable because it would allow us to work harder and smarter. I would have more to do than I can handle because I can get it done fast. Once you uncork the genie, everyone will go wild.”

-Director of Consumer Insights at a leading shoe store chain

Research Methodology

To learn how the leading retailers are using market basket analysis (MBA), The FactPoint Group recently interviewed over 50 top retailers with revenues ranging from \$400 million to \$24 billion. In these interviews, the retailers discussed how they currently use MBA as well as how they see their use of MBA growing in the future. The interviews were conducted with retail vice presidents, directors, and managers across merchandising, marketing, store operations and IT. The types of companies interviewed included a broad selection of retailers, from hardware stores to clothing retailers to convenience stores.



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