



## Deep Dive

# Using Prescriptive Analytics To Improve Customer Satisfaction

Retailers are missing out on opportunities to improve customer satisfaction, and thus revenue, that are easily within reach. Customer satisfaction impacts current revenues as well as future revenues from return visits plus visits based on reviews and opinions shared among consumers directly and via social media. Implementing prescriptive analytics is one method for leveraging and growing these revenue opportunities.

- Today's customers have little tolerance for out-of-stocks, pricing inconsistencies and quality issues. These situations are among the top customer reasons for leaving a store without making a purchase.
- The current fulfillment environment requires retailers to manage multiple fulfillment options—such as curbside pickup, in-store purchases and home deliveries—which all affect customer satisfaction.
- Many elements of customer satisfaction correlate directly to operational efficacy, such as inventory management, fulfillment accuracy and efficiency, customer service and addressing shoppers' safety concerns.
- Prescriptive analytics offers additional opportunities for retailers to enhance revenues, reduce costs and improve loyalty and efficiency.

Deborah Weinswig  
CEO and Founder  
Coresight Research  
[deborahweinswig@coresight.com](mailto:deborahweinswig@coresight.com)

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*Retailers are missing out on opportunities to improve customer satisfaction, which translates directly to missed sales opportunities. Prescriptive analytics is well-suited to address these opportunities.*

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### What's the Story?

Retailers are missing out on available opportunities to improve customer satisfaction, which translates directly to missed sales opportunities—essentially, they are “leaving money on the table.” Many of these opportunities are operational in nature, relating to inventory management, allocation or assortment, while others are centered around customer service and safety concerns for shoppers and employees in the current environment.

Prescriptive analytics is well-suited to address these opportunities. It draws data from a variety of structured (hard, statistical data) and unstructured (textual data within online reviews and comments) sources, compares actual data to expected behavior in real time and identifies the discrepancies plus the necessary corrective actions. These actions are sent to the most-appropriate person to remedy the situation, and the platform follows up to ensure that the action was taken and to monitor the outcome. Prescriptive analytics continuously looks for areas in which improvements are needed.

Focusing on the key areas of operational efficacy directly impacts customer satisfaction, keeping shoppers loyal and coming back, driving sales and increasing average basket sizes, and ensuring that the appropriate number of sales associates are on hand to both handle expected traffic and also convert into sales.

This report, sponsored by Zebra Technologies, discusses the relationship between retail customer satisfaction and the application of prescriptive analytics to make critical operational improvements. We also provide a brief overview of the benefits and functionality of prescriptive analytics, and additional areas for revenue enhancement, cost reduction and operational improvement that such platforms positively impact.

### Why It Matters

Maximizing customer satisfaction is essential for retailers, since it translates directly to revenue: Satisfied customers are likely to buy more, return to a physical store or e-commerce website more often, and share their experience with other consumers verbally or via reviews or social media, which creates a network effect. On the opposite end of the customer-satisfaction spectrum in this age of social media, unhappy consumers may (and likely will) broadcast their dissatisfaction to friends, acquaintances, review sites and social media followers, which could negatively impact a brand's or retailer's image and deter potential new customers. Customer satisfaction is therefore critical for customer acquisition and retention.

Figure 1 lists the top five reasons why shoppers leave a store without making a purchase, according to a global survey of shoppers and retail professionals conducted by Zebra Technologies. The top two reasons are related to inventory—caused by retailers having insufficient stock or assortment—and the next two are based on pricing. The fifth highlights the importance of checkout efficiency. Prescriptive analytics offers solutions for all five of these issues.

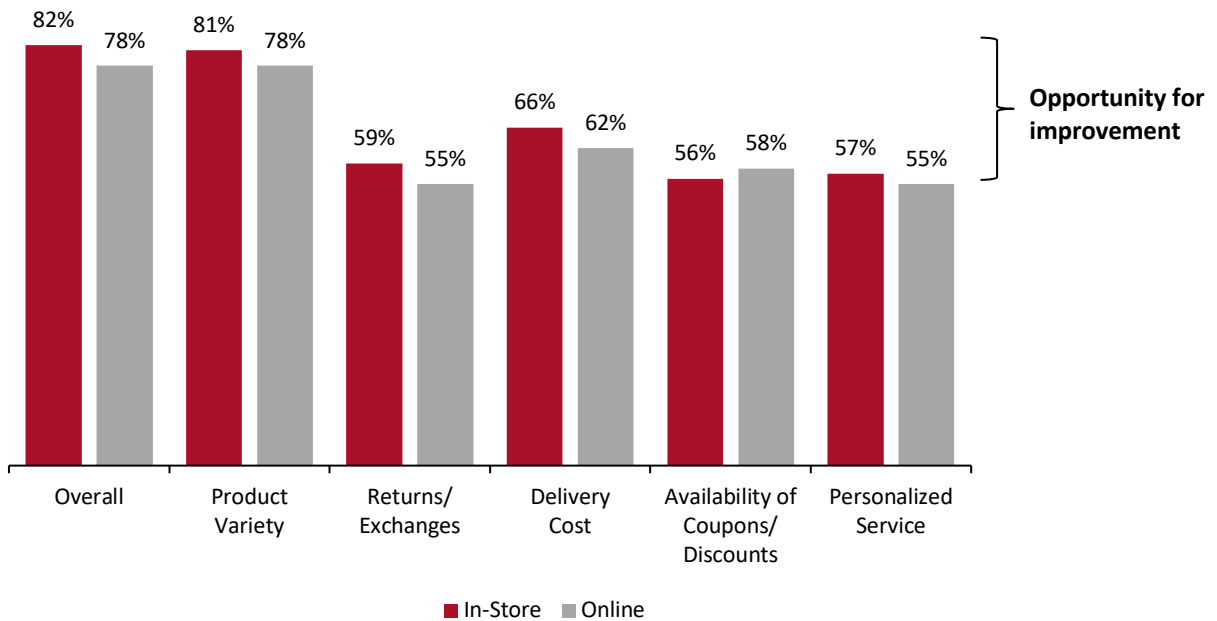
**Figure 1. The Top Five Reasons Why Shoppers Leave a Store Without Making a Purchase**

<b>1</b>	<b>Out-of-stock</b> —Item was not available
<b>2</b>	<b>Selection</b> —Did not like the product choices
<b>3</b>	<b>Competitive merchant</b> —Found a better deal
<b>4</b>	<b>Pricing discrepancy</b> —In-store price differed from online price
<b>5</b>	<b>Checkout line</b> —The queue was too long

*Base: 4,800 shoppers and 1,500 retail professionals, store associates and retail executives globally, surveyed in August/September 2019*  
*Source: Zebra Technologies*

Whereas overall global shopper satisfaction and product-variety satisfaction are relatively high at around 80% on average, ratings in the remaining categories hover within the 50–60% range, leaving room for improvement. Online satisfaction generally trails in-store satisfaction, as shown in Figure 2.

**Figure 2. Global Shopper Satisfaction, by Category**

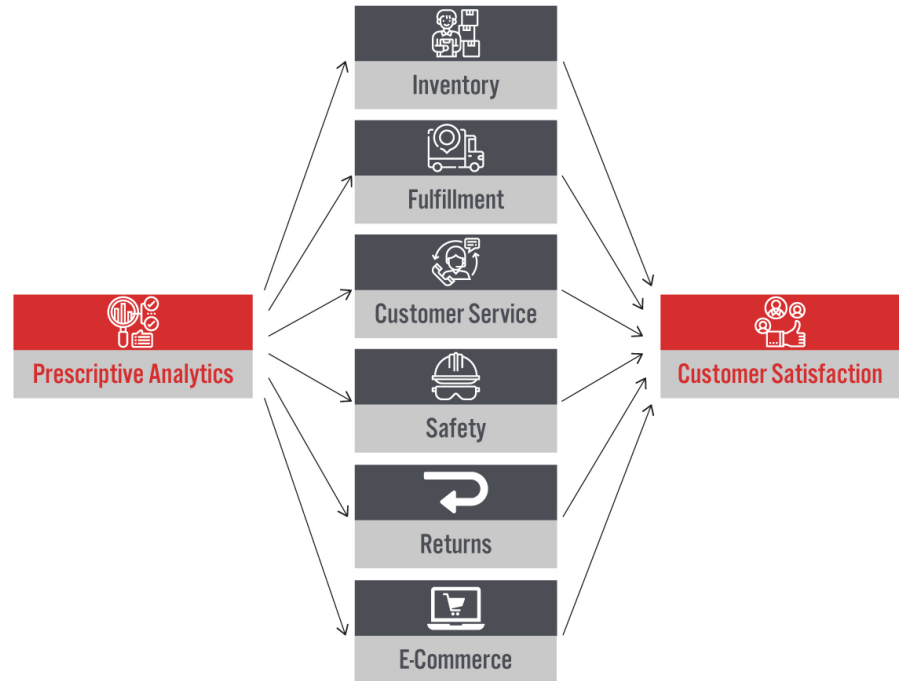


*Base: 4,800 shoppers and 1,500 retail professionals, store associates and retail executives globally, surveyed in August/September 2019*  
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*Prescriptive analytics empowers retailers to improve inventory performance, enhance fulfillment, optimize customer service and increase safety in both the purchasing and returns processes, leading to improved customer satisfaction.*

Prescriptive analytics empowers retailers to improve inventory performance, enhance fulfillment, optimize customer service and increase safety in both the purchasing and returns processes, leading to improved customer satisfaction, as illustrated in Figure 3 and as discussed in subsequent sections of this report.

**Figure 3. Areas Through Which Prescriptive Analytics Enhances Customer Satisfaction**



Source: Coresight Research

### Using Prescriptive Analytics To Improve Customer Satisfaction: A Deep Dive

#### Prescriptive Analytics: Overview

Prescriptive analytics takes one important step beyond other analytics methodologies by “prescribing” corrective actions for identified opportunities. The corrective actions are sent directly to a specific stakeholder to ensure a desired outcome, while also adding accountability to the process by making it easier for managers to verify execution. It corrects one of the major weaknesses of business analytics: a heavy reliance on reports, often lengthy summaries of data that require the recipient to interpret, which are static (lacking a feedback loop), do not monitor compliance and are easily biased.

A prescriptive-analytics platform represents more than just a software application—it is a platform that connects to all areas of a retailer’s business—sales, supply chain, inventory, customers, planning, allocation, logistics and more—to flag opportunities for improvement and determine corrective actions across the retailers’ IT infrastructure and operations. Data sources may be structured (i.e. quantitative) or unstructured (such as online text reviews), and internal or external (such as weather data, typical traffic patterns, etc.).

The capabilities of prescriptive analytics far outweigh those of predictive analytics in the areas outlined in Figure 4.

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**Figure 4. Prescriptive Versus Predictive Analytics**

Category	Prescriptive Analytics	Predictive Analytics
Input Formats	All data formats (structured and unstructured), historical and “like” stores	Time-series data
Analytical Methods	Artificial intelligence/machine learning	Predictive models
Output Formats	Actionable insights in near-real time	Reports
Complexity	Simple text-based directives	Requires coding ability
Results	Prescribes actions and tracks compliance/outcomes	Variable and subject to bias/error

Source: Coresight Research

Prescriptive analytics empowers retailers to understand the following aspects of a situation (with examples):

**Example one:**

- **What is happening**—There are no sales for a specific product in a specific store, which usually sells 100 units a day.
- **Why it is happening**—The store shows 400 units in inventory, so the shelf is likely empty.
- **What needs to be done about it and by whom**—The system sends a message to a store associate to verify on-shelf availability and to move inventory from the storeroom to the shelf display as necessary.

**Example two:**

- **What is happening**—Dairy shrink is up 30% at store #91 for the week.
- **Why it is happening**—Dairy markdowns happen to be below average for the week, suggesting associates are not marking down product that is approaching expiration.
- **What needs to be done about it and by whom**—The dairy managers are directed to retrain dairy associates on markdown compliance.

Benefits

Prescriptive analytics cuts through noise and bias by sending the right information (the problem and what to do about it) to the right employee at the right time.

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**Figure 5. Benefits of Prescriptive Analytics**

Benefit	Discussion
Accountability	Workflow function verifies that the issue was resolved
Smart Tasking	Corrective tasks assigned based on data analysis with high effectiveness
Clarity	Directives are issued in unambiguous, easy-to-understand text
Timeliness	Alerts issued in real time
Connectivity	Links with in-store devices: Internet of Things, cameras, smart shelves and robots

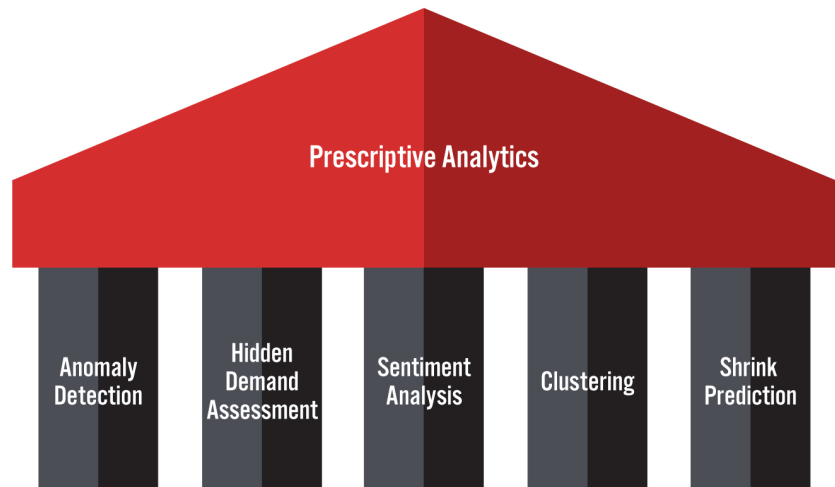
Source: Coresight Research

**Functionality**

Prescriptive analytics uses five core capabilities to locate enhancement opportunities within a retailer’s operations, as depicted in Figure 6.

*Prescriptive analytics uses five core capabilities: anomaly detection, hidden demand assessment, sentiment analysis, clustering and shrink prediction.*

**Figure 6. Core Capabilities of Prescriptive Analytics**



Source: Coresight Research

- **Anomaly Detection**—Prescriptive analytics scans a wide variety of retail metrics to determine an average or baseline performance level. The solution issues alerts and associated corrective actions when actual performance drops from the baseline of “like” stores and products. This capability catches labor inefficiencies, fraud, inventory inaccuracies, vendor performance, product quality and freshness, logistical bottlenecks, non-compliance, promotion-execution gaps and more.
- **Hidden-Demand Assessment**—Prescriptive analytics locates revenues that *could* have been collected but were not, due to products not being on the shelf for purchase, being in an unsalable condition or from other issues that prevent a sale, both online and in-store. While these missed sales opportunities do not necessarily show up on the income statement, they steadily add up to millions of dollars per year, lost to avoidable mistakes.
- **Sentiment Analysis**—Text in product reviews and other sources can be mined and translated into a “score” to on performance around key themes such as customer satisfaction with pricing or product quality. This information can be used to determine whether improvements are needed,

*Prescriptive analytics benefits from the use of artificial intelligence—which continuously strives to improve the accuracy of its algorithms—and machine learning, which excels in finding relationships and patterns among disparate sources of data.*

as well as where the retailer is excelling (by determining whether the unstructured data bears positive or negative sentiment).

- **Clustering**—Prescriptive-analytics platforms aggregate data from customers, employees, stores and/or regions to create “clusters” based on similar characteristics or behaviors. This process enables a more precise form of anomaly detection by flagging entities’ (products, stores, truck drivers, associates, etc.) behavior that is inconsistent compared to the rest of their cluster.
- **Shrink Prediction**—Prescriptive analytics analyzes sales data to identify theft, fraud and supply-chain problems, as well as to determine where shrink is at highest risk of occurring, and prescribe corrective actions.

Prescriptive analytics is further strengthened by artificial intelligence, which continuously strives to improve the accuracy of its algorithms, and machine learning, which excels in finding correlations and telltale patterns of behavior among disparate sources of data.

### **Relationship Between Operational Efficacy and Customer Experience**

Customer experience and operational efficacy are typically not considered to be directly related, and retailers generally pursue these goals via separate teams. However, the management of inventory, including such aspects as assortment, planogram compliance and quality control, has a direct impact on customer satisfaction, as do operational drivers of customer service and the perception of customer and employee safety.

Below, we discuss the effects of inventory management, fulfillment, customer service and the enforcement of customer and employee safety protocols on customer satisfaction, as they relate to the capabilities of prescriptive analytics.

#### Inventory

Inventory availability has a tremendous impact on customer satisfaction.

Shoppers are left disappointed when desired items are not in stock (both online and in stores), leading them to either choose a half-baked substitute or not make a purchase at all. In the worst case, the customer may decide never to return to that store—instead buying the product elsewhere—negatively impacting future revenue potential for the retailer far beyond the loss of that one sale. Inventory availability is even more crucial during the current Covid-19 pandemic, in which consumers are making fewer, more-targeted shopping trips—making each trip of greater importance. Having to travel to another store could expose the shopper to a potentially unsafe environment, compounding their negative sentiment to the retailer on top of the out-of-stocks.

Retailers face two key challenges regarding inventory: improving availability and offering the proper assortment. Prescriptive analytics can help ensure that retailers optimize inventory accuracy and availability in the following ways:

**Avoiding stock-outs.** Items at risk of being out-of-stock are identified. Findings can be used to transfer more stock from the backroom to on the shelf. When an inventory shortage is predicted, a prescriptive analytics platform can determine whether the cost of expedited shipping, drop-shipping or other fulfillment methods is justified.

*The management of inventory and assortment has a direct impact on customer satisfaction, as do operational drivers of customer service and the perception of customer and employee safety.*



*“Phantom inventory” refers to inventory that appears in the management system but does not actually exist, and this can distort planning.*

**Managing peak demand** (e.g. natural disasters, holidays, etc.). Calendar information, weather forecasts and local event data can be incorporated into a good prescriptive analytics solution based on a capability called “demand sensing.” Demand sensing updates plans and projections based on the latest “real-time” data trends, maximizing sales and minimizing waste to adjust inventory levels to accommodate these special events.

**Ensuring correct allocation.** Retailers are using prescriptive analytics to determine the optimal allocation of inventory to individual stores in order to best accommodate demand.

**Increasing accuracy.** Inventory distortion stems from a variety of causes, including theft, unreported damages and mis-deliveries. Whatever the cause, inventory distortion leads to inaccuracies, which can disappoint customers in the form of canceled orders or products being unavailable in store, which is especially damaging if the website claimed there *was* stock available.

**Avoiding phantom inventory.** Similar to the above, “phantom inventory” refers to inventory that appears in the management system but does not actually exist, due to shrink and supply-chain issues. Phantom inventory distorts planning as it inflates on-hand stock levels, in turn leading to sub-optimal assortment allocation that does not follow actual consumer preferences. The pain of phantom inventory is even greater for popular items due to missed sales opportunities caused by delayed replenishments; the more inventory a management system wrongly thinks is available, the longer it will take to trigger a replenishment.

**Reducing spoilage, waste/damage; ensuring quality and freshness.** Prescriptive analytics monitors product expiration dates and time on the shelf, ensuring that consumers only receive fresh and viable goods and thus preventing disappointment, inconvenient returns or worse, a food-safety incident. Better yet, this reduces waste, which translates into improved margins.

**Achieving sufficient localization.** Prescriptive analytics compares sales figures from different stores to determine what its main shopper demographic buys the most, and then using its findings to localize assortment to its tastes. Corrective actions are issued as necessary to corporate planners, recommending adjustments to each store’s allocation per local preferences.

**Identifying optimal in-store location.** Prescriptive analytics analyzes sales data to determine where certain items should be placed to maximize sales. The best-known example of this is the concept of complementary items, which involves identifying certain products that are often purchased together (such as bananas and broccoli or wine and diapers), and directing store associates to place them closer together on the sales floor.

**Ensuring planogram and pricing compliance.** Consumers want to find the merchandise they desire quickly and easily. To ensure this, retailers dictate product placements with detailed graphics called planograms, which factor in considerations like paid placements, margin potential, popularity, brand and more. Compliance with planograms is critical to avoiding financial penalties and/or hits to the customer experience when they cannot find the items they need. In addition, retailers must ensure prices are aligned between in-store and online. A customer who walks into the store and finds an item priced higher than he or she saw online is likely going to suspect a bait-and-switch and may never shop with that retailer again.

*Prescriptive analytics can determine the optimal allocation of inventory for curbside pickup (the demand for which is likely to surge during times of panic buying) versus availability for in-store sales or ship-from-store.*

### Fulfillment

Prescriptive analytics determines the optimal allocation of inventory and labor to fulfill online-placed orders via curbside pickup (demand for which is likely to surge during times of panic buying), ship-from-store and BOPIS (buy online, pick up in store). This ensures the optimal balance of resources between online and in-store shoppers.

In addition, prescriptive analytics assesses pickers' performance, generating metrics around lead-times, item substitutions and customer data, such as return activity, compliments and complaints.

### Customer Service

Staffing, training and task prioritization are customer service-centric activities that prescriptive analytics optimizes.

**Staffing.** Prescriptive analytics monitors key store metrics such as staffing efficiency, customer traffic and worker productivity and is therefore able to calculate the appropriate staffing levels to ensure customer satisfaction. It also identifies how to balance available labor between in-store and online-order pickup stations for optimal coverage.

**Training.** Prescriptive analytics identifies telltale signs of training gaps, such as dips in efficiency and non-compliance with company policies—both of which can have irreversible impacts on customer satisfaction if not promptly addressed. The right solution will prescribe employee training to bring behavior in line with company guidelines.

**Task Prioritization.** Prescriptive analytics prioritizes tasks in terms of their customer-service and financial implications. This helps retailers focus on tasks, with the most impactful results first.

### Safety Concerns

Prescriptive analytics also enforces three types of guidelines that have become essential during the Covid-19 pandemic: social distancing, quantity limitations and the suspension of returns.

Prescriptive analytics analyzes hourly cashier transaction rates to identify individuals who are not enforcing social distancing and other protocols. As an example, a cashier who is completing transactions at a higher rate than cashiers at the same store with a similar level of experience may not be requiring customers to stand the necessary distance apart, nor sanitizing his or her hands, the register or other areas between transactions.

Transactional data also shows whether a cashier is following guidelines on maximum quantities to be sold, and flag for retraining if not. Reprogramming an entire organization's array of POS (point of sale) systems to recognize quantity limitations can take weeks, making this capability essential for inventory-minded retailers.

Many retailers suspended returns during the outbreak to prevent employees and customers from handling potentially infected merchandise. Prescriptive analytics detects attempts to process returns in certain scenarios in which POS terminals may still allow it. Such measures may allay fears around contracting the virus by buying pre-purchased merchandise, although it could frustrate those customers

that are unable to make returns. In general, the health implications far outweigh any inconvenience to the customer.

*Prescriptive analytics offers additional benefits for retailers, including opportunities to increase revenue, reduce cost and improve efficiency.*

**Benefits for Retailers**

In addition to enhancing customer satisfaction through better management of inventory and assortment, customer service and adherence to safety protocols, prescriptive analytics offers additional benefits for retailers.

These benefits include opportunities to increase revenue, reduce cost and improve efficiency, as illustrated in the image below.



*Enhancement opportunities from prescriptive analytics*  
Source: Zebra Technologies

Revenue-enhancement opportunities include the following:

- **Maximize sales**—Prescriptive analytics provides a comprehensive view of consumption and demand, helping to ensure that essential or hot-selling products remain available.
- **Reduce walkouts**—Prescriptive analytics reduces customer frustration due to out-of-stocks, pricing inconsistencies and availability issues, therefore increasing dwell time within the store and offering potential for higher sales via impulse buys and upselling.
- **More effective marketing**—Increased satisfaction through better product assortment and availability as well as more-personalized offers bears three primary benefits that boost the return on investment of marketing campaigns:
  - Increases traffic
  - Improves loyalty
  - Raises the average basket value

Prescriptive analytics also lowers retailers' costs via the following:

- **Fewer markdowns**—Better inventory accuracy and assortment enables retailers to sell to the last item, rather than having to steeply discount buffer stock.
- **Better-empowered loss prevention**—Prescriptive analytics identifies and prescribes corrective actions to combat fraud by employees, customers, vendors and players in the supply chain, much faster than any human with a report-based solution like prescriptive analytics.
- **More staffing efficiency**—Prescriptive analytics compares customer traffic and transaction volume in order to determine the optimal staffing per store throughout the day, in addition to identifying causes of low labor productivity in stores.
- **Lower expediting costs**—The right solution will assess whether the expected sales of a product that is running low justifies the added cost of expediting or drop-shipping replenishment stock, in addition to calculating the optimal quantity of products to expedite.

*Prescriptive-analytics tools can help retailers successfully manage current complexity and reduce consumer frustration due to out-of-stocks, pricing inconsistencies and availability issues.*

#### What We Think

Execution in retail is more complicated at present due to rapid, tectonic shifts in consumer demand toward necessities and e-commerce, including online order fulfillment. Prescriptive analytics solutions help retailers successfully manage this complexity and reduce consumer frustration due to out-of-stocks, pricing inconsistencies and availability issues.

Even in normal, stable times, these tools help retailers secure those additional dollars of revenue and realize cost reductions that are available to them but unseen due to a lack of awareness or follow-through in execution.

#### Implications for Brands/Retailers

- Prescriptive analytics helps brands and retailers enhance customer satisfaction, which in turn increases revenue, loyalty and average basket size.
- Brand and retailers can also use prescriptive analytics to make other operational changes that further increase revenues and efficiency as well as reducing costs.
- Improving satisfaction and efficiency is even more compelling in the current environment, with many retailers experiencing cash crunches and heightened consumers-safety concerns.

#### Implications for Technology Vendors

- The broad spectrum of retailers means that there are many opportunities for vendors with specific capabilities to target the appropriate market segments.
- Analytical tools and artificial intelligence/machine learning continue to evolve and improve, so there are opportunities for vendors to leverage recent developments to enhance the performance of their platforms.

- Vendors offering standalone prescriptive analytics solutions or integrated platforms with these capabilities are likely to possess a competitive advantage over those lacking such technology.

**Other Coresight Research Reports**

For more information on prescriptive analytics and its benefits for retailers, please see our report [\*Facing the Challenges of Modern Retail with Prescriptive Analytics\*](#).

**Deborah Weinswig, CPA**

CEO and Founder  
Coresight Research  
deborahweinswig@coresight.com

**John Harmon, CFA**

Senior Analyst

-----  
**New York • Hong Kong • London • Mangaluru (India) • Shanghai**  
**Coresight.com**