



Prescriptive Analytics Makes Waves with Retail & CPG



Introduction

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It is no secret that brick and mortar retail and Consumer Product Goods (CPG) companies have seen their fair share of change. First and foremost, both are trying to navigate the additional pressures brought on by a much savvier consumer, who is increasingly looking for consistency in their shopping experience. They are also battling the reduced barrier to entry by pure play ecommerce companies and the continued surge of straight to consumer CPG providers. Each of these industries also has its own unique challenges. For brick and mortar retail that includes high employee attrition, a varied workforce by skillset and age, product uncertainty, and ecommerce’s growing popularity. For CPG companies that includes availability of goods, ecommerce competition, private label, and a more fickle retail customer.

One of the ways both industries have seen success combatting this new environment is by embracing prescriptive analytics. Prescriptive analytics goes beyond legacy reporting by providing specific actions to resolve or capitalize on opportunities that are highlighted in the data.¹ These actions not only allow for a universal resolution (i.e. consistency) of any issues found, they engage more people across the organization in a way that doesn’t require data scientists. Prescriptive analytics democratizes data across a variety of departments and users, ensuring that everyone involved is following the same operating procedures.

Gartner has taken a strong stance in its belief that it is necessary for prescriptive analytics to be used by more than data scientists. The analyst firm has stated that it must become part of the operational fabric of a company, which is why by 2018, decision optimization such as prescriptive analytics, will be a best practice used by leading organizations to address a wide range of business decisions.² In short, leading retail and CPG companies have found that prescriptive analytics is an innovative and productive way to generate consistency across stores, banners, and products to increase sales and margins.

The fact that these two industries are leading the charge with prescriptive analytics is no surprise. The most successful retail and CPG companies have always been at the forefront of technology innovation and adoption. These two segments have

a long history of using data to make decisions, and often work together to ensure that consumers have the product(s) they want to purchase available to them at the right place and time.

Why Retail and CPG Embraced Prescriptive Analytics

One of the reasons prescriptive analytics has taken such a stronghold within retail and CPG is because they are both data rich industries. In the United States alone, there are almost 4,000,000 retail establishments, employing 42 million people, and contributing \$2.6 trillion to the GDP.³ The average Walmart store sees 37 million customers come through their doors every day.⁴ Walgreens operates 8,175 stores in the United States.⁵ In 2015 their average basket size was 5.5 units, with an average sale of \$17.78.⁶ In 2016, fashion retailers sold around 34 million pieces of merchandise.⁷ Think about how many data points can be generated from a single location: the product, size, style, color, quantity, basket size, customer demographics, coupon use, date, time, payment type, etc. It is easy to understand why 40% of these organizations are looking to invest in BI and analytics as a priority.² The data is overwhelming!

Analytics are just as important for CPG companies, with consumers spending \$407 billion in 2016.⁸ Unilever employs over 169,000 people⁹ to manufacture and sell more than 400 brands¹⁰ and 50,000 SKUs^{11,12} in more than 190 countries.⁹ Around the world, 2.5 billion people use Unilever products each day,⁹ so the amount of data collected by CPG companies is even greater than that of retailers since they both generate their own data and collect additional information from retailers who sell their products.¹³ All of this data can be leveraged by CPG companies using prescriptive analytics to determine if they are producing enough of the right products in the right place at the right time for purchase.

Making Sense of All that Data

Within any industry there are leaders, followers, and laggards. For those within retail and CPG who are not currently leading in terms of technology innovation, their approach involves using an analytics tool that generates reports, whether

presented on paper or in a graphical dashboard. Many within these two industries believe that because they're using analytics and generating reports, they are leaders. As Gartner has argued previously, that is not the case. The reason for this is even the most sophisticated BI analytics tools are used inconsistently because each analyst uses and interprets the data differently. Once the report is produced, the analyst decides who should receive the report, with no understanding of action or outcome. The large amount of data input means that there is an equally large output of reports. Relying on reports and visualizations sets up retailers and CPG companies to fail as more reports do not equal better results, no matter how beautiful or how slick the user interface.



What it does equal is both industries drowning their employees in data and reports, with no consistency and no visibility into the resolution. If the same report is given to seven people, there is a strong possibility they will interpret it in seven different ways. This means some glaring issues and problems may never be found and the root cause of other issues may never truly be identified. Plus, once a problem is uncovered, there is often no clear methodology on what to do next and to determine whether the issue has been acted upon.

Leading retailers and CPG's have identified six major points of failure with traditional reporting methods:

1. Did the intended recipient get the reports(s) and/or have time to open it?
2. Did the intended recipient understand the report(s) (i.e. rows, columns, heat maps, graphs, bubbles, etc.)?
3. Did the intended recipient get the proper insights out of the report(s)?
4. Does the intended recipient know how to fix any issues identified within the report(s) and/or what to do about it?
5. Who owns the action and did he/she take action to fix the issue?
6. What is the value of fixing the issue, rather than relying on a gut feeling?

Prescriptive analytics easily addresses these points by creating an automated analytical process that identifies only when there is an issue. It tells you what the issue is, and how to resolve it. All this information is then automatically sent to the appropriate person who should be addressing it. He/she is provided with step by step instructions (prescriptions) on how to correct the issue, in easy to understand plain language, and the value of each opportunity is measured and tracked.

Prescriptive Analytics in Action

For example, retail and CPG companies historically struggle to identify availability of their products in a store on any given day. Sell-through or sales reporting is provided when it is often too late. The only people that really know what is going on are typically at the store level. Prescriptive analytics can identify when a product is not on the shelf and available for the customer either because of non-compliance, fraud, or other possible product performance root causes. When a high performing item has suddenly stopped selling and units show on hand, a prescriptive action is sent to the appropriate store personnel to ensure that the item is in the proper location on the shelf and not in the backroom. This reduces lost sales opportunities and provides the expected sales lift.

Successful retailers are consistently looking to augment how much customers are spending in stores as well as online. As foot traffic goes down, conversions go up because people are only visiting stores when they want to buy something. To maximize revenue, basket analysis becomes crucial. Prescriptive analytics enables retailers to see what items are sold together, which associate helps increase the number of items per transaction, etc. CPG companies also use this information

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to identify which vendor promotions are the most successful, in which retailers, and how to better pair products in the future.

Prescriptive analytics also enables retailers and CPG companies to review promotional execution by analyzing data such as advertising spend and promotion participation. Recommended actions measure which areas have effective participation with high advertising spend and which areas would see the most benefit from additional advertising focus by category, area, price, competition, etc. By being more targeted, this enables retailers to increase customer loyalty and spend. CPG companies are also able to be assured they're creating enough of the right products for their retail customers.

These are just a few examples of the successes retailer and CPG companies are achieving with prescriptive analytics. This is also why Gartner says the number of organizations using prescriptive analytics will grow by more than 36% over the next 4 years.² Gartner also states that by 2018 decision optimization, such as prescriptive analytics, "will no longer be a niche discipline but a best practice used by leading organizations to address a wide range of complex business decisions."²

Conclusion

Leading retail and CPG companies are taking a smarter approach to problem solving by leveraging prescriptive analytics. It has enabled them to extract meaningful insights from the vast amounts of data they generate on a day to day basis. They are doing this without having large teams of analysts and thereby maximizing their human capital at all levels of the organization. Putting the right information in the hands of people who need to take action, at the right time, and collecting their feedback creates a process of continuous improvement.

The key to starting with prescriptive analytics involves finding the right solution. There are a lot of vendors in the industry who claim prescriptive analytics capabilities, but what they are really offering is another dressed up reporting tool. Retailers and CPG companies who haven't invested in this technology should look for a system that does not require data scientists or PhD's to handle it, a solution that can be implemented in a matter of days to see immediate results, a solution that offers a closed feedback loop so that everyone understands when corrective actions have been taken, and a solution that can be accessed anywhere, at any time.

In summary, what prescriptive analytics brings to retail and CPG is quite unique in its simplicity. It makes the ordinary every day actions of employees and store associates extraordinary by taking simple tasks and perfecting them so that they can be done in a highly efficient, and consistent manner. That is why prescriptive analytics is yielding increased sales and margin improvement, and why the industry will continue to see it as the go-to innovation investment needed for future growth and success.

Source: Profitect

¹<http://www.gartner.com/it-glossary/prescriptive-analytics/>

²Gartner, Forecast Snapshot: Prescriptive Analytics, Worldwide, 2017

³<https://nrf.com/advocacy/retails-impact>

⁴<http://www.businessinsider.com/facts-about-wal-mart-2015-6>

⁵<http://news.walgreens.com/fact-sheets/frequently-asked-questions.htm>

⁶<http://infoscout.co/retailer/walgreens>

⁷<https://www.statista.com/outlook/90000000/109/clothes/united-states#market-arc>

⁸<https://www.statista.com/statistics/318087/consumer-packaged-goods-spending-of-us-consumers/>

⁹https://www.unilever.com/Images/unilever-fact-sheet-2016-7th-march_tcm244-504411_en.pdf

¹⁰<https://www.unilever.com/investor-relations/understanding-unilever/about-unilever/>

¹¹<http://www.foodnavigator-usa.com/Manufacturers/Less-is-more-Unilever-to-slash-SKUs-by-30-by-end-of-2014>

¹²<https://www.fool.com/investing/2016/10/27/findings-at-unilever-illustrate-why-sku-rationaliz.aspx>

¹³<http://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/winning-in-consumer-packaged-goods-through-data-and-analytics>

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“Leading retail and CPG companies are taking a smarter approach to problem solving by leveraging prescriptive analytics.”

Research from Gartner

Forecast Snapshot: Prescriptive Analytics, Worldwide, 2017

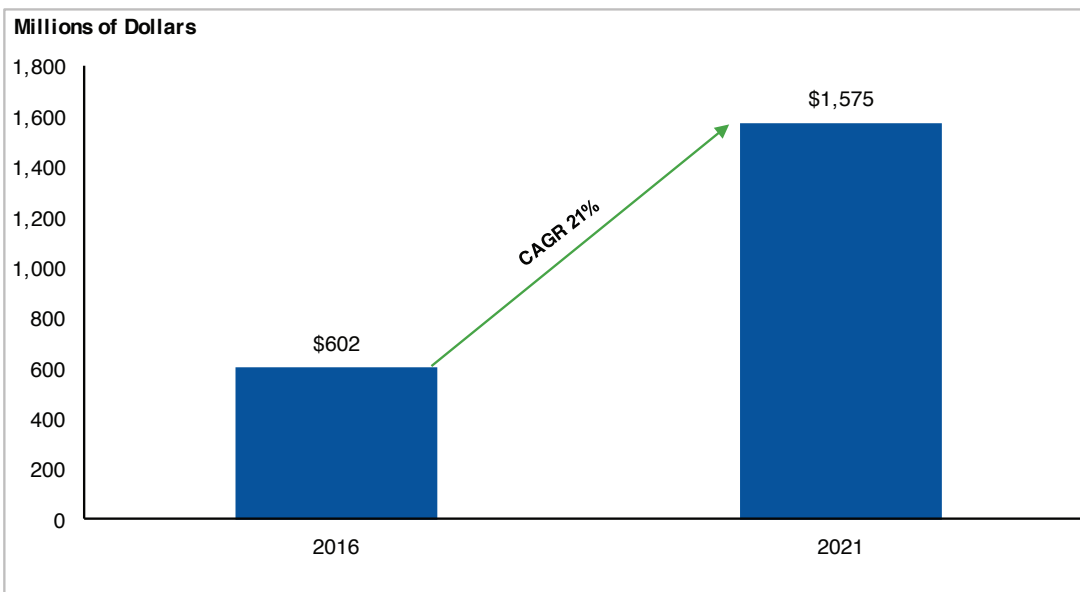
The prescriptive analytics software market will reach \$1.57 billion by 2021, with a 21% CAGR from 2016. Technology strategic planners must understand the market opportunities for prescriptive analytics when planning their business strategy to build and market their data and analytics offerings.

Key Findings

- More organizations are moving up the analytics maturity ladder and building analytics capabilities beyond descriptive analytics to predictive and prescriptive analytics. By 2020, Gartner estimates that predictive and prescriptive analytics will attract 40% of enterprises' net-new investment in business intelligence and analytics.
- Overall buyer awareness and interest in the value of analytics and data-driven decision making continue to be key growth drivers. Currently, 10% of large and midsize organizations have some form of prescriptive analytics; this will grow to 36% by 2021.
- Prescriptive analytics is moving beyond its core community of operations research and management science professionals and becoming increasingly embedded in business applications.
- By 2018, Gartner estimates that decision optimization will no longer be a niche discipline but a best practice used by leading organizations to address a wide range of complex business decisions.

Market Size and Forecast Growth Rate

FIGURE 1 Enterprise Spending on Prescriptive Analytics, Worldwide, 2016 and 2021



CAGR = compound annual growth rate
Source: Gartner (May 2017)

Analysis

Introduction

Prescriptive analytics is a form of [advanced analytics](#) that examines data or content to answer the question: “What should be done?” It is characterized by techniques such as graph analysis, simulation, complex-event processing, neural networks, recommendation engines, heuristics and [machine learning](#). Although all types of analytics aim to improve decisions, only prescriptive analytics outputs a preferred course of action rather than a report, statistic, probability or estimate of future outcomes. It takes predictive insights to the next level by suggesting the optimal way to handle a future situation. Prescriptive analytics can be applied to strategic, tactical and operational decisions, each of which has different traits. The recommended decision can be delivered to a human in a decision support environment, or it can be coded into a system for decision automation. By 2018, decision optimization will no longer be a niche discipline but a best practice used by leading organizations to address a wide range of complex business decisions.

Market Definition

Prescriptive analytics is the application of logic and mathematics to data to specify a preferred course of action. The most common examples are optimization methods, such as linear programming; decision analysis methods, such as influence diagrams; and predictive analytics working in combination with rules. Prescriptive analytics differs from descriptive, diagnostic and predictive analytics as its output is a decision.

Buyer Dynamics

While optimization techniques have been around for decades, they have often been overlooked because of the high levels of skills needed to apply the technologies. This is starting to change as organizations are investing more in data science and decision management skilled resources. Plus, vendors are making their prescriptive analytics offerings easier to use by less skilled citizen data scientists.

Because prescriptive analytics often leverages predictive methods, its adoption tends to be higher among companies that have built predictive capabilities. Many organizations that adopt prescriptive analytics have some experience with predictive analytics and are doing a type of prescriptive analytics without calling it such. As a consequence, they are not fully aware of the full

range of methodologies offered by prescriptive analytics. While it is possible to jump from descriptive to prescriptive, many organizations proceed through each phase.

Some use cases are very mature, such as optimization in supply chain and logistics, cross-selling, database marketing, and churn management. But many new use cases are emerging with as yet unknown potential. Therefore, it is still early days for broad adoption and awareness. Further, organizations need to move up the analytics maturity ladder — progressing beyond descriptive analytics to predictive and prescriptive analytics — before they can achieve full benefit from prescriptive analytics offerings.

Vendor Dynamics

While many ERP and supply chain vendors have offered embedded prescriptive capabilities for organizations to optimize decision making for decades, use has largely been reserved for the largest enterprises and is still a relatively new idea for most organizations. With the growing interest in predictive analytics by end-user organizations, vendors are now extending their advanced analytics platforms to include prescriptive analytics capabilities.

The targeted users for prescriptive analytics are analytics and business leaders looking to use more advanced analytics to help guide and automate complex decision making. Current market penetration of prescriptive analytics is 2% to 6% of the target audience, with main offerings from AIMMS, Ayata, Decision Lens, Earnix, FICO, Frontline Systems, Gurobi Optimization, IBM, MathWorks, Pros, River Logic and SAS. As more organizations deploy predictive analytics, we expect more analytics platform and application vendors to add prescriptive analytics to make it easier for organizations to turn predictions into recommended actions to improve decision making. The Internet of Things (IoT) will become a key driver for vendors to add prescriptive analytics capabilities to IoT platforms to address both consumer and industrial use cases.

Prescriptive Analytics Market Size

To establish the size of the prescriptive analytics market in terms of end-user spending, we:

- Identified and tracked a set of 20 vendors representing the market share in the stand-alone prescriptive analytics market. We then checked the estimate against other data

points, including vendor press releases, online database and other content aggregators, vendor financial reporting, and subject matter expert analyst inputs in the prescriptive analytics markets.

- Analyzed the top stand-alone prescriptive analytics vendors (AIMMS, Angoss, Decision Lens, Earnix, FICO, Gurobi Optimization, IBM, MathWorks, Pros, River Logic, SAS and Sparkling Logic) and estimated that their 2016 revenue was \$447 million and that they accounted for 89% of the market.
- Analyzed and compared years of user survey data from advanced analytics practitioners and thousands of user inquiries to assist in qualifying supply-side revenue estimates with historical and current demand with user estimations of future use.

Prescriptive Analytics Forecast Assumptions

For emerging software markets like prescriptive analytics, we model growth based on organizations' adoption and vendor supply-side activities. At this stage in the analytics application life cycle, we believe application spending is most strongly driven by the following influencing factors:

- Software adoption across more organizations
- Expansion of the user base within an organization
- Expansion of the functionality being utilized within organizations
- Innovation in technology and product design

The system replacement rate, a core variable in packaged application spending in more mature areas, is not currently a major variable in our five-year forecast assumptions because of the relative immaturity of the technology.

In this context, we make the following assumptions about the prescriptive analytics market:

- Ten percent of large and midsize organizations currently have some form of prescriptive analytics, and this is forecast to grow to 36% by 2021. The bulk of new adoption will be

from large and midsize organizations in mature economies in the financial services, retail, manufacturing and logistics industries.

- Adoption is currently 6% of potential seaholders, and this is estimated to grow to 22% of potential seaholders by 2021. Expansion of the user base for prescriptive analytics will affect the market modestly at first but more markedly toward the end of the forecast period.
- The average user base will grow 16% annually in 2017 within organizations using prescriptive analytics. Successful use of prescriptive analytics within an organization depends on the existence of highly automated and data-centric business processes. The more widespread such processes are, the greater the benefits that prescriptive analytics will provide. Some use cases for prescriptive analytics are already established. But as digital transformation increases, more of these processes will be available.
- Expansion due to greater functionality will cause the average user base of an organization using prescriptive analytics to grow by three times over the course of the forecast period. When organizations achieve successful business outcomes from analytics projects, this feeds their enthusiasm to use analytics to a greater extent, improving on the earlier projects, which drives expansion of the market.

Methodology

Forecast Snapshots provide a reasonable estimate of the global market size and five-year CAGR for market segments that are not covered by a regular Gartner Forecast report. The methodologies used for both sizing the markets and establishing their growth forecast may vary from one to another, and they rely heavily on analyst judgment and experience. In time, if the market segments evolve and gain critical mass, Forecast Snapshots may be superseded by regular Forecast publications, which are based on a more in-depth methodology. This may lead to significant changes in our estimates for market size and growth rate.

This Forecast Snapshot focuses on total end-user spending on prescriptive analytics, including new licenses, updates, upgrades, cloud, subscriptions and hosting, technical support, and maintenance (see "Market Definitions and Methodology: Software").

Our forecasting methodology is developed by a multistep process:

- We calculate the five-year CAGR for the category as a whole. For example, if our published forecast shows that data science platforms as a category are growing 8%, that becomes our baseline for subcategories such as prescriptive analytics that roll up under it.
- We determine Hype Cycle placement. This allows us to calibrate where a subsegment's growth might be in relationship to the category as a whole.
- We compile vendor revenue history (from Magic Quadrants, Market Share documents and published financial reports). This further helps us calibrate subsegment growth.
- We compare our forecast assumptions to the latest available market indicators, such as vendor sales and pipelines, vendor strategy, new product roadmaps, and IT spending data.
- We then generate preliminary forecasts, which are peer-reviewed with individual subject matter experts and revised as necessary.
- Finally, we roll up our submarket forecast estimates to check for consistency with our published segment-level forecasts. The sum of our submarket estimates cannot exceed our segment-level forecast.

Source: Gartner Research, G00326363, Jim Hare, Alys Woodward, Hai Swinehart, 3 May 2017

About Profitect

Since 2012, Profitect has offered a suite of solutions to help retailers easily understand and act on their data. They help companies leverage existing big data investments and drive value generation by not requiring technical resources to understand and interpret data. Instead of sending someone a report to analyze, Profitect's prescriptive analytics tells them exactly what happened and how to take action to correct it. It's that simple. Profitect helps retailers in every segment and across the retail business operation to realize improved sales, margins and compliance. With customers across the world, they have amassed a vast library of patterns combined with machine learning to automatically identify behaviors quickly. They offer a unique implementation that allows customers to be live in days and believe customer success is of the highest priority. Profitect has been recognized as the industry leader for technology and customer choice.



Contact Profitect

1601 Trapelo Road, Suite 286, Waltham, MA, USA

+1-781-290-0009

info@profitect.com

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