Beyond the hype:
Capturing value from big data and advanced analytics

Consumer-facing companies must be able to gather and manage the right data, turn it into insights, and translate those insights into effective frontline action.

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Retailers and consumer-packaged-goods (CPG) companies have long had access to vast amounts of transaction data: every day, companies capture information about every SKU sold to every customer at every store. In addition, companies regularly use sophisticated market-research techniques to answer a variety of questions: what products should we develop and sell? How much is the customer willing to pay? Which products should we discount and when? Which marketing vehicles will allow us to reach the most customers?

With reams of data and market research already at their fingertips, some consumer companies are understandably skeptical about the much-hyped promise of social-media information and other large data sets now known as big data. Others see the potential but are cautious about making large IT investments, especially as they recall their experiences with customer-relationship-management systems that proved difficult to integrate into their business processes. Can big data and advanced analytics truly deliver more useful insights than existing tools? Will the return on investment from large-scale data warehousing and IT systems make a meaningful difference to the bottom line?

Our experience working with several large consumer-facing companies indicates that the answer to both questions is yes. We believe big data and advanced analytics are among the most

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important battlefields for retail and CPG companies today. Benefiting from big data and analytics, however, isn't a given; companies must invest in the right set of capabilities and keep certain success factors in mind. In this article, we discuss the potential of big data and advanced analytics for the retail and CPG industries, and what it takes to turn this potential into actual value.

Immense possibilities
Big data makes it possible for companies to better understand customers' shopping behavior at each stage of the "consumer decision journey." By analyzing online browsing and searching histories, for example, companies can learn the alternatives customers look at when considering buying a product, the important factors in their final purchasing decision, and how they put together their shopping baskets—information that can help companies identify valuable up-selling and cross-selling opportunities. Companies can also monitor how customers talk about a product on social media, including why they purchased it, which features they like and dislike, and what would prompt them to purchase it again. Companies can use these analyses to create more accurate "customer decision trees"—tools to help explain which products in an assortment are substitutable and which are complementary—and thus refine their offerings in both offline and online stores. Furthermore, technology now makes it easier to track customers' responses to media campaigns and promotions, giving companies insights into how to better target their media spend and create more profitable promotions.

Such data and analyses can help companies make better, faster decisions in their day-to-day business—including decisions about product

innovation, assortment, pricing, promotions, and retailer-supplier negotiations. Recent research by McKinsey and the Massachusetts Institute of Technology shows that companies that inject big data and analytics into their operations outperform their peers by 5 percent in productivity and 6 percent in profitability.[1] Our experience suggests that for retail and CPG companies, the upside is at least as great, if not greater.

Tesco, for one, attributes its success in part to insights generated through big data and advanced analytics. The European grocery retailer introduced a loyalty card in the late 1990s, using it as a vehicle for the systematic collection and analysis of shopper data. The company has since mined online and social-media information as well. It has developed a full set of advanced analytics—encompassing more than 20 analytical tools in its commercial functions—to support day-to-day decision making. Its insight-driven commercial strategy has contributed to sustained profitability: since 2000, Tesco has improved its profitability every year, more than tripling its profits between 2000 and 2012.

Making it happen: Three ingredients
What steps must companies take, then, to capture value from big data and advanced analytics? In our work, we have found that fully exploiting data and analytics requires three capabilities. First, companies must be able to choose the right data and manage multiple data sources. Second, they need the capability to turn the data into insights—that is, they must combine deep analytical talent with commercial judgment. Third and most critical, management must undertake a transformational-change program so that the insights actually yield better business decisions and translate into effective frontline action.

[1] See Erik Brynjolfsson and Andrew McAfee, "Big data: The management revolution," *Harvard Business Review*, October 2012, and Dominic Barton and David Court, "Making advanced analytics work for you," *Harvard Business Review*, October 2012.

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Managing the data

As they embark on a data-and-analytics journey, many companies default to a "data forward" approach—that is, they gather whatever data they think might prove useful or simply use data they already have, in hopes that it will yield valuable insights. But big-data initiatives shouldn't be fishing expeditions. We recommend instead a "decision back" approach, which begins with the company answering two related questions: which decisions do we want to improve? What data and analyses will help us improve those decisions? The answers to these questions will also be important during the later stages of the journey, when analytics experts are making choices about how to structure the data, where to push for 100 percent data accuracy, and whether to buy off-the-shelf software or invest in building proprietary solutions.

A retailer may, for instance, seek to make better decisions about its promotional spending. Here, the range of decisions can be quite broad: do we want to optimize the design (number of pages, number of products on each page) of our promotional leaflets and circulars? Do we want to reassess the distribution of our circulars—which newspapers they should be inserted into, which addresses they should be delivered to, and so on?

Do we want to rethink the product mix in our circulars? Each decision requires different data and analyses.

In identifying, sourcing, and managing data, retailers face a number of challenges:

The sheer number of transactions, as well as the time period required for analysis. As mentioned earlier, the number of daily transactions and data points in retail is immense. To understand trends, companies must capture mountains of data over several years. They therefore must invest in robust databases that allow decision makers easy access to the data they need. Fortunately, data-storage capacity is becoming available at lower and lower costs; some companies are turning to software-as-a-service solutions to meet their evolving IT needs.

Data matching across repositories. A retailer's loyalty-card database, for instance, doesn't easily match up with its database containing product costs—which means implications on revenues will be straightforward to derive, but implications on gross margins will not. Leading companies are using new applications that can match different types of data from different databases by recognizing patterns.

Data "hygiene" and reliability. For instance, product information—package sizes, product descriptions, or even the category in which a product belongs—isn't always up-to-date in retailers' databases, in part because maintenance of data on a massive number of SKUs (as many as 300,000 for some large retailers) is a time-consuming and laborious effort.

Lack of history on certain data. Promotional uplift, for example, strongly depends on a product's in-store position (a central promotional island versus an endcap versus a shelf). Some companies haven't historically recorded products' in-store positions, making interpretation and analysis of promotional uplift tricky. As a consequence, retailers sometimes develop a flawed or incomplete picture because they don't have all the relevant data. Some companies are overcoming the lack of data through crowdsourcing. There are apps, for instance, through which a company can pay individuals to go to local stores to take photographs or gather data, which they can then submit to the company online.

Translating data into insights

Managing the data is just the first step. Companies need to next make sense of the flood of data. Sophisticated algorithms and analytical tools can help, but the tools alone don't constitute a competitive advantage. Rather, it is the knowledge of how to leverage the tools that can vault a company above its competitors.

Companies must hire, develop, and retain skilled analysts who can distinguish relevant from irrelevant data, draw the right assumptions, and translate information into insights. But it's important to strike the right balance between analytical expertise and commercial sense. Retailers are of course commercially driven organizations. The key is to recruit top-notch analytical talent without subverting the company's commercial DNA. Analytics should be an enabler for the commercial functions, not an end in itself. We have seen more than one retailer make the mistake of placing too much trust in a pricing-elasticity algorithm, for example, without questioning or debating its counterintuitive recommendations; these retailers increased prices, promptly lost market share, became disillusioned with the analytics, and abandoned the tools entirely.

Another common issue is the "black box" problem: big-data initiatives deliver unexpected results, and the owners or leaders of the initiative can't explain the results in a way that stakeholders can understand. At other times, the answer is wrong, and the owners lose credibility when they try to defend their work. A way to avoid these pitfalls is to hire talent with analytical horsepower as well as acute commercial sense and business judgment. Individuals with both capabilities are in high demand and short supply; most companies will find that it's easier—and just as effective—to instead build a team of people with both sets of skills.

Turning insights into effective frontline action

Gathering the right data and having the right skills, however, won't yield impact unless the company can also turn data-driven insights into effective action on the front line. In most cases where companies have failed to generate value from big data, the reason has been insufficient attention to this third imperative.

Companies must make sure the new analyses and insights are embedded seamlessly into managers' and frontline employees' day-to-day decision processes. Software and tools should be intuitive and scalable. Processes should be defined in a way that managers and the front line can readily understand and adopt. For example, if a new workflow-management model crunches data on historical sales, planned promotions, and weather forecasts, then perhaps store managers could receive reports that estimate how many sales-floor employees and cashiers they will need every hour of the following week.

When designing new tools, companies should seek the least complex model that would improve performance. More sophisticated decision-support tools must be implemented very carefully; highly complex analytical algorithms (to calculate cross-elasticity or forecast demand, for instance) are at risk of not being understood and consequently not adopted. Leaders should prepare the organization for fundamental mind-set changes: people must be willing to reinterpret results, admit mistakes, and correct course if the data bring to light suboptimal decisions made in the past.

The front line should receive intensive training and coaching on the new model, and managers' incentives should be aligned to support the new way of working. One consumer-goods company, for instance, launched a program to boost the profitability of its promotional spending and introduced a new promotions-analysis tool for the sales force. Senior management even led the training for the program. But sales reps embraced neither the program nor the tool,

because company incentives and reporting protocols for sales managers tracked sales—not profits. After a series of discussions with sales managers, the company relaunched the program, introducing new profit-related incentives and reports.

Factors for success

Enabling an organization to benefit from big data and advanced analytics is a journey that can either yield dividends at each stage or generate frustration if investments don't pay off. We have found the following actions can help keep the journey on track:

Secure quick wins. Choose one or more areas where a focused investment in big data and analytics can prove the business case quickly. One European CPG company selected a discrete topic under the larger umbrella of generating growth in mature categories. In its highly competitive categories, it had come to rely on product innovation—which at times can be both expensive and risky—to spur growth. It used data on consumer attitudes and behaviors, as well as advanced analytics, to revolutionize its retailer-specific assortments and planograms: by understanding exactly which SKUs were selling well in which retail formats and determining which SKUs to swap in and out to best meet consumer preferences, it is now seeing 10 percent sales growth in a low-growth category. The early success of this initiative has generated a wave of activity on related topics, with strong business-unit pull for the new ways of thinking. Once the business case is established, the organization can get behind longer-term and larger-scale investments in data and analytics.

Require senior-executive sponsorship. Any big-data initiative needs an energetic senior sponsor who will dedicate at least 5 percent of his or her time to making the initiative a success. Senior sponsors must be involved right from the start and make sure the big-data experiment follows a decision-back structure. They then need to participate in validating results and use their authority to rewrite the relevant business processes.

Look to external examples. Most companies cannot rely on their organizations alone to find and clarify their big-data opportunities. This is an area where companies might think about taking an "open source" approach, tapping into external experts and networks for help on their biggest analytical challenges. Consumer companies can also take inspiration from big-data success stories, not just in the consumer sector but in analogous

industries; some groundbreaking initiatives in health care, government, and financial services, for instance, offer useful lessons for retail and consumer-goods players worldwide.

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We see great potential for consumer-facing organizations that adopt big data and advanced analytics as a platform for growth. Companies can begin by agreeing on which business decisions they want to improve, defining their step-by-step journey and securing the right talent, and effecting the transformational change that will embed big data into their daily processes. Done right, such an initiative will have a payoff that will be more than worth the investment. ○

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