McKinsey & Company

Retail Practice

Supercharging retail sales through geospatial analytics

A retailer can now use geospatial analytics to understand the interactions between its online and offline channels. With these insights, it can create a higher-performing retail network.

by Rob Hearne, Alana Podreciks, Nathan Uhlenbrock, and Kelly Ungerman

March 2019

Is our outlet store in San Francisco hurting foot traffic and sales at our full-price store two miles away? Or is it doing the opposite—attracting new customers and making them more likely to visit both stores? How are our five Manhattan stores affecting our e-commerce revenue? Are they making consumers more likely to shop on our website or to search for our products on Amazon? If we open a new mall store in the Dallas metro area, what impact will it have on sales at our existing stores, at our department-store partners, and online?

The answers to these kinds of questions are increasingly crucial to a retailer's success, as more and more consumers become omnichannel shoppers. Guessing wrong can lead to lost sales and expensive real-estate-investment mistakes. Yet most retailers don't give adequate thought to the cross-channel impact of their stores. They rely on gut feel or on high-level analysis of aggregated sales data to gauge how their offline and online channels interact with each other, and they assume that cross-channel dynamics are the same in every market—when, in fact, every single customer touchpoint affects the rest of the retail network in its own unique way, depending on a vast range of factors.

The good news is, there's a way for retailers (and other omnichannel businesses) to quantify cross-channel effects, thus taking the guesswork out of network optimization. Through advanced geospatial analytics and machine learning, a retailer can now generate a detailed quantitative picture of how each of its customer touchpoints—including owned stores and websites, wholesale doors, and partner e-commerce sites—affects sales at all its other touchpoints within a micromarket. In other words, using geospatial analytics allows a retailer to see its retail network as a complex system, rather than just individual locations or independent channels coexisting in a market.

This broader view helps a retailer make better decisions about precisely where and how to reshape its network to maximize value—whether it's by opening new stores in underpenetrated markets, shifting its channel strategy in oversaturated markets, or making store-level refinements in underperforming markets. Done right, the result of data-driven network optimization can be double-digit revenue growth. Some retailers have identified opportunities to increase their sales by as much as 20 percent.

The omnichannel consumer journey

US retail sales are on an upward trajectory. In 2018, American consumers spent approximately $3.68 trillion on retail purchases, up 4.6 percent from 2017—and, despite the growth of e-commerce, the vast majority of these purchases still happened in brick-and-mortar stores. Even brands that started as pure-play online retailers—eyeglass retailer Warby Parker, mattress company Casper, and even Amazon, to name a few—have expanded or have announced plans to expand into the brick-and-mortar world. So why have US retailers closed thousands of stores in the past year, with thousands more closures to come?

Clearly, one big reason is that the consumer journey is changing and has been for some time. Consumers aren't just transacting in different channels, shifting more of their spending from physical stores to e-commerce sites; they're also engaging across multiple channels, often simultaneously rather than sequentially. It's therefore critical for omnichannel retailers to have a detailed understanding of the interplay between online and offline touchpoints, and between owned and partner networks.

In our previous article, we explained how the use of geospatial analytics enables retailers to understand the sales drivers in each store and zip code in their network.[1] But there are several other powerful applications of geospatial analytics for retailers—including, for instance, shedding light on

[1] Alana Podreciks, Nathan Uhlenbrock, and Kelly Ungerman, "Who's shopping where? The power of geospatial analytics in omnichannel retail," July 2018, McKinsey.com.

foot-traffic patterns and consumer demographics in a retail network, or on nascent trends in cross-shopping behaviors. In this article, we focus on one of the more cutting-edge applications of geospatial analytics for an omnichannel retailer: sales attribution. In other words, geospatial analytics can help a retailer accurately quantify the effects of offline and online sales channels on each other, thereby illuminating opportunities to capture the market's full sales potential.

Quantifying cross-channel effects

With any geospatial-analytics initiative, the starting point is data. A retailer seeking to optimize its omnichannel network must assemble data from a wide range of internal and external sources (see sidebar, "It all starts with data," on page 6). Inputs into a geospatial model would ideally include not just transaction and customer data but also store-specific details such as store size and product mix; site-specific information such as foot traffic and retail intensity; environmental data, including local-area demographics; and anonymized mobile-phone location data. Using machine-learning algorithms, a retailer can learn which factors most influence sales in every zip code, then calculate actual and potential sales for each store and each local market.[2]

A simulation model can then quantify the sales effect of each of the retailer's customer touchpoints on its other channels within a local market. The model must be sophisticated enough to simulate the upward or downward revenue impact of adding or removing a particular touchpoint.

Geospatial analysis reveals that the consistency and magnitude of cross-channel effects vary significantly across channel types and markets. Exhibit 1 shows that, in one market, a retailer's full-price stores consistently boost online sales. Its wholesale channels, on the other hand, have a mixed record: some of its department-store partners have a positive impact on its online sales, but the rest are detrimental to the retailer's e-commerce performance.

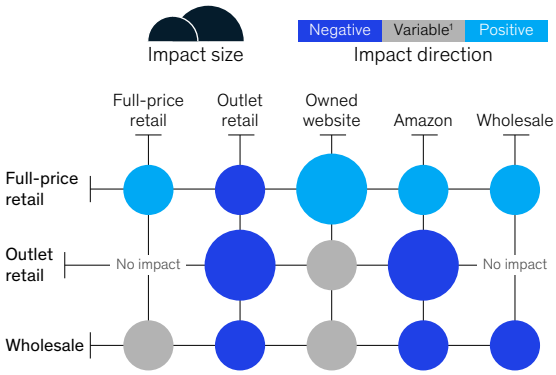
While nationwide channel trends sometimes emerge, we've found that sales-channel behavior is highly market specific. Retailers should therefore make market-level channel decisions rather than sweeping, networkwide mandates to arrive at their optimal footprint.

Furthermore, geospatial analysis typically reveals that two stores, even if they're located near each other, can have very different effects on the overall network. For example, Exhibit 2 shows two of a retailer's stores in the same town: a full-price store that contributes more than just the in-store revenue it generates, and an outlet store that cannibalizes other stores and online sales, thus reducing its net value to the network.

Exhibit 1

Using geospatial analytics, a retailer can understand how its sales channels interact with one another within a market.

Sales-channel interaction



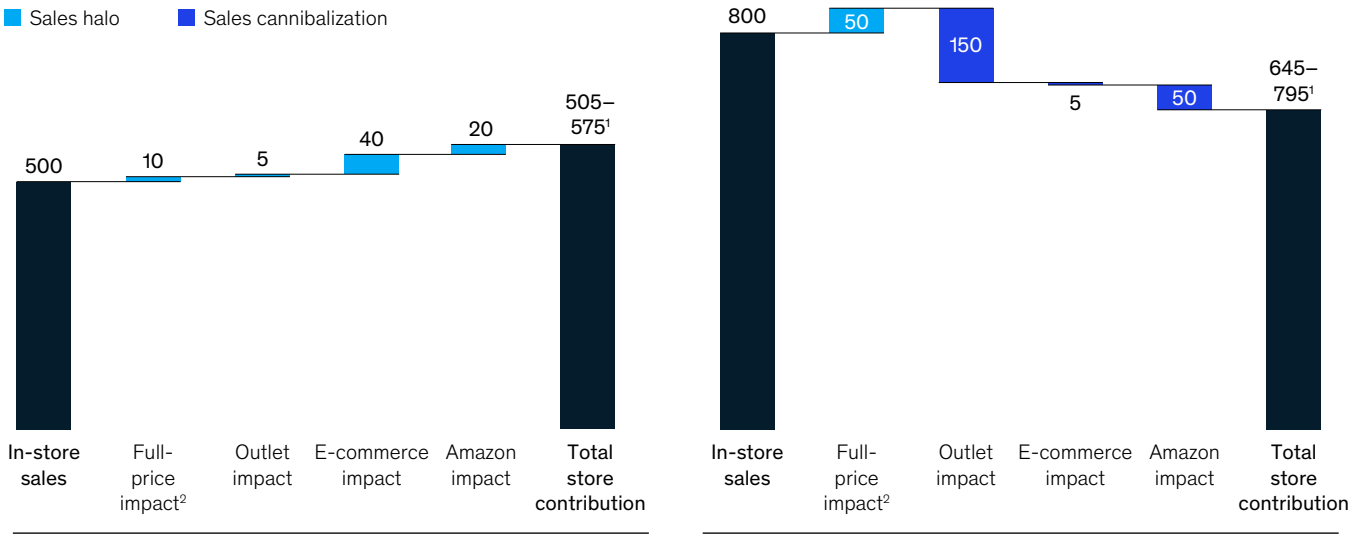
[1] Some of the stores have a positive impact on the channel; others have a negative impact.

[2] Ibid.

Exhibit 2

Two retail stores in the same market can have very different effects on the retailer's overall sales.

Sales and cross-channel impact, $ thousand



Store #1, a full-price store, positively interacts with all other channels. Its total contribution is therefore greater than in-store sales.

Store #2, an outlet store, cannibalizes other outlets and the online channel, so its total contribution is lower than in-store sales.

[1]Total store contribution listed as a range because impacts are not perfectly cumulative.
[2]"Full price" = traditional brand-owned retail stores; "outlet" = off-price brand-owned stores; "e-commerce" = brand-owned online store.

Three types of market opportunities

Acting on insights derived from geospatial analytics, retailers have been able to optimize their networks and unlock growth in three ways: by expanding in underpenetrated markets, by rebalancing the network in oversaturated markets, and by fine-tuning customer touchpoints in markets performing below their potential (Exhibit 3).

In 'white space' markets, open new stores

Some markets are underpenetrated—that is, the retailer's sales in the area are much lower than potential sales, the retailer isn't fully capturing cross-channel halo effects, and there's enough latent demand to support more retail doors. These markets represent attractive expansion opportunities.

Case example: Through geospatial analytics, a global specialty retailer identified a number of markets in which there was a large gap between actual and potential sales, and in which the company had a wholesale footprint and strong online sales but no owned stores. In each of these markets, the retailer opened one or more full-price stores and subsequently saw sales increases of 4 to 10 percent.

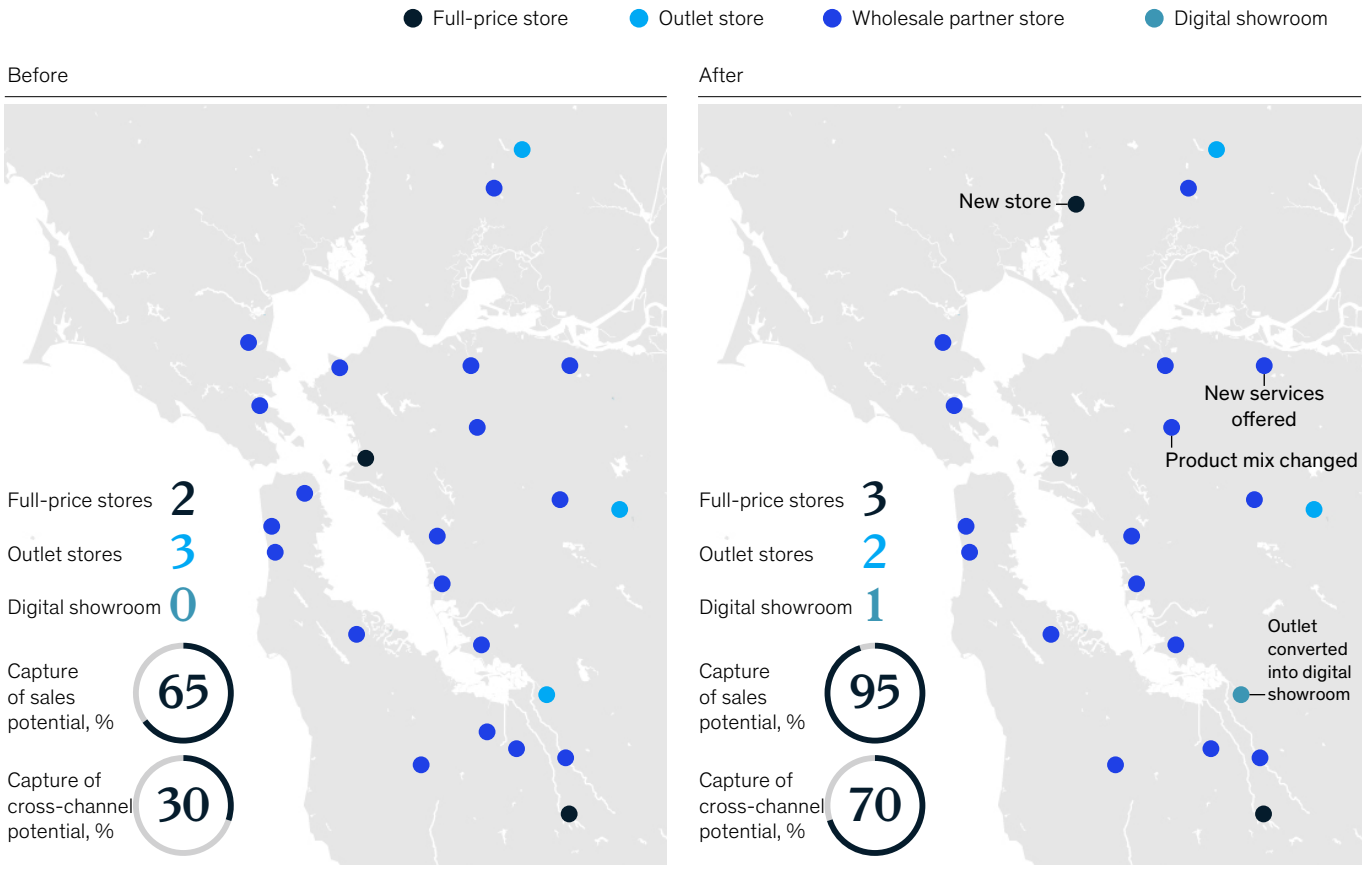
In oversaturated markets, rebalance the network

Other markets might be oversaturated, with less-profitable channels or retail doors cannibalizing the more profitable ones. In these markets, retailers can rebalance their network by converting one or more stores to a different format (for instance, turning a full-price store into an outlet or vice versa).

Exhibit 3

Geospatial analytics helped a retailer decide what changes to make to its store network.

Sample market, illustrative



Source: OMNI by McKinsey

Case example: A specialty retailer found that in one US market, its outlet stores cannibalized not only each other but also its full-price stores and its website. Furthermore, it discovered that Amazon was essentially functioning as an outlet store in that market: local customers who purchased the retailer's products on Amazon opted for heavily discounted items, largely ignoring the brand's full-price offerings.

Further analysis showed that there was enough demand in that market to sustain more full-price stores. The retailer decided to convert two outlets into full-price locations and a third outlet into a digital showroom, with limited on-site inventory, more space dedicated to product displays, and interactive screens for customers to browse the website and place online orders. In addition, the retailer developed new strategies to win on Amazon, such as focusing on "power SKUs" (high-volume items with limited style variance that could be profitable for both Amazon and the retailer), developing "only on Amazon" items to discourage price comparison, and marketing its products more aggressively on Amazon via sponsored listings and keyword buys.

Sidebar

It all starts with data

Without good data, advanced-analytics capabilities won't have much business impact. Unfortunately, we've found that many retailers still haven't bolstered their data-collection and data-management processes. Retailers receive data sets from a variety of sources and in different configurations, yet they don't invest in cleaning up the data sets or in making them easily accessible to others; information is often incomplete or not sufficiently granular; and there's no central repository into which account reps can enter data. As a result, even internal data aren't readily usable for network optimization.

Ideally, a retailer's distribution partners—such as department stores or third-party e-marketplaces—would share granular, market-level data on who's buying what where. But retailers can't always rely on non-owned channels to provide any data, much less high-quality and sufficiently detailed sales data. And even if distribution partners do agree to share information, it may be of a different type or in a different format than the data in the retailer's own systems.

Retailers can take the following steps to ensure they're gathering useful, reliable data:

— **Assemble a team to capture data and to make the data ready for analytics.** Data analysts, data-quality managers, and business-solution architects can help identify the data needed for business-specific outcomes and make sure the data are clean, accurate, and standardized. The team should also include finance and sales staff, who will collaborate to vet the data every month. Team members should cross-reference the aggregated outputs with financial systems and reporting, as there is generally a reconciliation gap. They should look out for differences in how stakeholders format and define their data (such as the time period for various sales cycles, how discounts or markdowns are accounted for, and so on).

— **Seek systematic access to distribution partners' data.** Team members will need to cultivate relationships with distribution partners, including wholesale accounts, and find ways to systematize the data-sharing process. Amazon, for instance, typically provides access to a brand's sales data through a downloadable "order history report." The team should work with account reps to aggregate data on sell-in and sell-out dollars and units by brand, category, and wholesale door. Another option is to work with a wholesale data-aggregation vendor or third-party data provider.

— **Make selective investments in enterprise data management.** Prioritize the most important data assets and sources, make sure information is easily accessible and findable by the people who need it, and define and maintain an acceptable level of quality. A retailer should evaluate its approach to enterprise data management on an ongoing basis, not as a one-time activity.

— **Ensure that customer privacy and data security continue to be top priorities.** Given the high risks and severe consequences of data breaches, retail leaders should keep privacy and data security top of mind across the organization. Hiring or developing security-specific talent is critical, as are mandatory training programs for current employees.

Retailers shouldn't invest in geospatial analytics unless they're also willing to invest in getting good data and setting up the infrastructure to use it. Of course, raw data alone won't be enough; retailers will also need to identify or hire translators—people who can liaise between analytics teams and business decision makers to structure problems, form hypotheses, and help turn data and analytics into business insights and actionable recommendations. But the better the data, the more granular these insights and recommendations can become.

In underexploited markets, fine-tune each touchpoint

A retailer may find that it already has the optimal density and variety of sales channels in a market. But with some fine-tuning of specific touchpoints—for example, moving a store to a higher-traffic location within a mall or partnering more closely with wholesalers to better tailor the assortment to the local market—the retailer could maximize sales and take full advantage of cross-channel halo effects.

Case example: For one specialty retailer, a valuable insight was the high tourist traffic in one of its markets. The retailer found that shoppers who live outside the metropolitan area accounted for 90 percent of sales. The retailer was able to increase sales in that market by 1 to 2 percent by making its stores even more tourist friendly—for instance, offering free shipping from the stores to shoppers' homes and investing more in localized marketing and signage to direct tourists to the stores.

No analytical model can predict the future. That said, the power of geospatial analytics in retail-network optimization is undeniable. With advanced capabilities in geospatial analytics, retailers can now view their network through an omnichannel lens and clearly see (and, to an extent, foresee) channel interactions that previously were practically invisible. Armed with these insights, retailers become better equipped to make bold decisions about their sales channels—decisions that translate directly into significant top-line growth.

Rob Hearne is an associate partner in McKinsey's Denver office; **Alana Podreciks** is the solution leader for OMNI, a McKinsey Solution, and is based in the New York office; **Nathan Uhlenbrock** is a senior expert in geospatial analytics, based in the Waltham office; and **Kelly Ungerman** is a partner in the Dallas office.

The authors wish to thank Courtney Andison, Mona Kashiha, and Sohrab Rahimi for their contributions to this article.

Designed by Global Editorial Services