

Applying Location as a Service (LaaS) for Omni-channel

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Applying Location as a Service (LaaS) for Omni-channel

Executive Summary

Retail is a location-centric business. Every transaction; every customer's home address, online search, and IP connection; every coupon offered and used; every delivery, store, and missed omni-channel purchase—each one of these can be analyzed and connected to any and every other action by location.

What is localization? In this context, it is using local market characteristics to place the right products at the right price in the right store at the right time. It requires location-specific planning and execution strategies across departments including targeted marketing, sales, merchandising, store operations, and distribution.

There's *Where* Everywhere in Retail

Location data is far more prevalent and powerful than most retailers realize. It's not common to think of the buying and selling process as happening because of *where*, so location data management and analysis are not at the center of most retail business activities. To compound things, none of the enterprise systems that most retailers use have been designed to truly create, manage, and share location-based insight.

Fundamental changes in the way large enterprises provision location infrastructure and whom they empower with it need to take place if retailers are to finally meet the challenges of mobility and the omni-channel. Only when retailers location-enable data from the customer touch points will they be able to meet customers' new expectations for purchasing, home delivery, and product availability.

This white paper describes how a location strategy and Location as a Service (LaaS) extend business strategies without replacing existing systems. This enables retailers to discover and extract insights that already exist in the organization, apply them to business operations, and improve omni-channel effectiveness.

Esri approach to LaaS enables organizations to work more collaboratively and turn location-based data into answers to business questions. Consumer expectations continue to change so retailers need a more sophisticated response if they truly want to impact the customer experience. It's time retailers started using real location insight to deliver on those expectations.

However, location data management and analysis are not at the center of most retail business activities. Most retailers don't think of the buying and selling process as happening *because of where*. As this white paper will explain, a location strategy and LaaS should be.

Omni-channel and Retail IT Infrastructure

Over the past decade, and most noticeably in the last three years, successful retailers have used information technology (IT) to increase customer retention and improve marketing affinity and operational excellence. The core enterprise technologies retailers use to accomplish this typically revolve around customer relationship management (CRM), marketing, merchandising, pricing, business intelligence (BI), and supply chain systems.

Customers expect a seamless experience as they research, engage, and purchase even as they move between mobile, web, and physical store locations. Back-end IT systems are used to try and make sense of these behaviors across every customer touch point and interaction with the retailer. They are used to try and integrate messaging and operations across channels with data-driven processes and solutions allowing marketing, distribution, merchandizing, e-commerce, and brick-and-mortar retail operations to work together. Despite spending hundreds of millions of dollars collectively, the results haven't always lived up to the hype. Why?

First, technology has added both cost and complexity to business operating environments. Second, most of these systems cannot effectively execute on the requirements of omni-channel campaigns. They don't usually deliver real-time insights such as individual attribution and reporting. Despite enormous effort, cost, and business pain bringing these systems and services together, most technology has failed to deliver significant value and progress.

Location and Retail IT Infrastructure

Retailers have missed one fundamental element—the true role and importance of location in retailing. For all the focus on demographics, merchandise, transaction history, and store size and format—as well as the strategy and systems behind information integration—none of the systems have been designed to truly create, manage, and share location-based insight. Location is a recent add-on to many systems. Some retailers are finding out that their systems were never designed to manage spatial data, with all its complexities of format, scale, and volume.

It does not need to be this way. Retail is truly a location-centric business. Everything in retail happens *somewhere*.

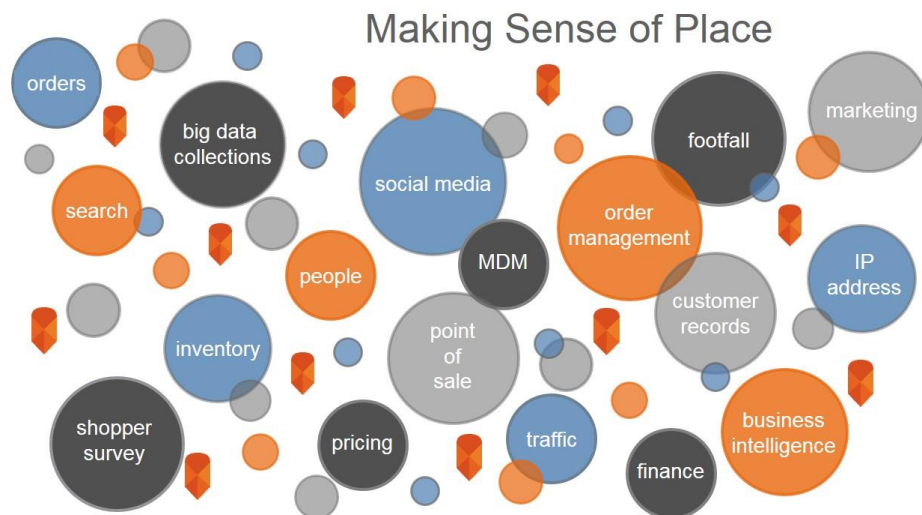


Figure 1: The Rich Variety and Sources of Location Data in Retail and the Omni-channel

Despite this, location is not at the center of a retailer's business activities; merchandise assortments are too often granular and aren't necessarily selected to match the true customer trade area.

Similarly, product planning and marketing are done in macro-geographies like metropolitan statistical areas or communities, which are too big to really understand what is happening at the transactional level.

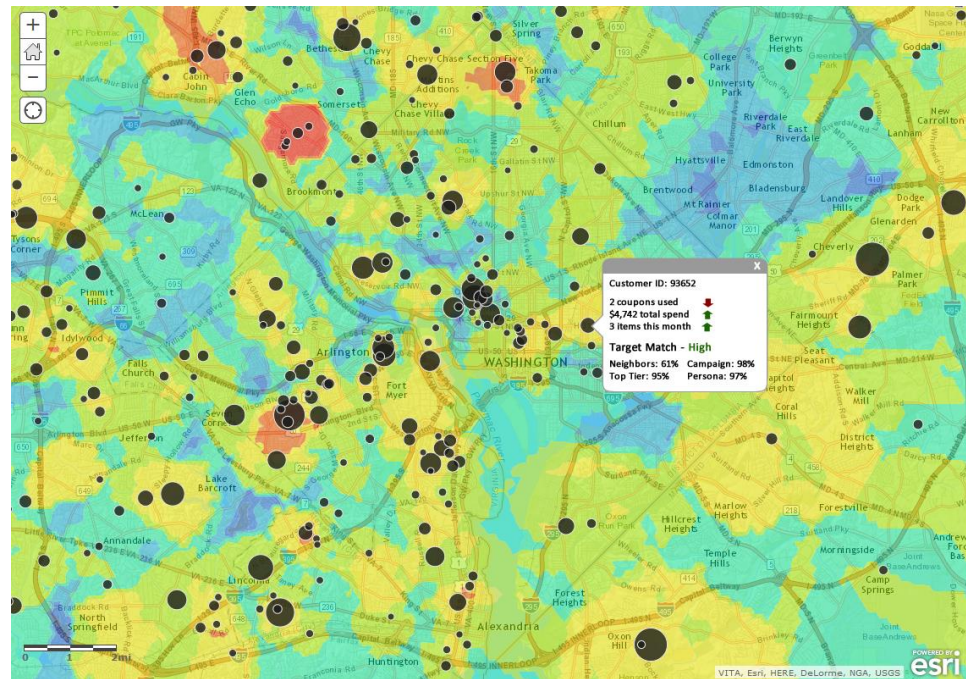
Fundamental changes in the way large enterprises provision location infrastructure and whom they empower with it need to take place if retailers are to finally meet the challenges of mobility and the omni-channel. Only when retailers location-enable data from customer touch points will they be able to meet customers' new expectations on purchasing, home delivery, and product availability.

Location in Retail— A Black Friday Example

Black Friday 2015 saw the most tangible evidence to date that retail has changed. It remains a key day for sales for both consumers and retailers. Consumers, however, are shopping in new ways. They are shopping earlier than ever (some stores opened on Thanksgiving afternoon for Black Friday shoppers) and more cleverly than before (price comparisons between local shops is easy to do thanks to a multitude of apps). The holiday shopping season promotions and huge sales peaks of yesteryear have been replaced by year-round provisions, advanced planning, earlier shopping, and mixing both online and in-store purchase channels.

Total in-store shopping was about the same as a year ago, while online sales grew by more than \$1 billion, pushing total sales ahead of 2014. According to Adobe, digital sales grew by 17 percent over the four-day weekend from last year to \$8 billion. Email promotions drove 25 percent more sales compared with 2014, while IBM noted that, for the first time ever, the majority of online traffic, 57 percent, came from mobile devices driving traffic through improved apps and mobile sites on tablets and smartphones.

These industry insights underline that shoppers are researching ahead of making a purchase, targeting visits to specific stores and products, and arriving in stores with the specific intention of making a purchase. Shopping no longer has borders inside a physical store because consumers no longer shop in one place, at one time, or in one particular manner. As a result, understanding the physical location along a customer's pathway to purchase is even more important so retailers can optimize their ability to make a sale.



Look at the map of shopping behavior from a retailer in the Washington, DC, Metro area as shown above. The background heat map is a predictive surface of where we would expect to find the best customers based on past purchasing patterns and likelihood of all customers to respond to a campaign. This heat map was created by combining data from a marketing system including in-app, email, social, and online data along with transactions from the company's loyalty and point-of-sale (POS) systems. By capturing, managing, and analyzing location-centric attributes of customers' shopping behaviors and responses, the retailer gains detailed, hyperlocal insight. It can see where sales are performing well and also where they might be lagging behind. These indexes and models can also highlight where changing tactics might bring the biggest reward. They can also pinpoint new opportunities. The point is, by viewing this information by location, the retailer is seeing data that might have been missed by another enterprise system.

At the top of the map, individual customers are displayed using different-sized circles based on affinity and engagement. Because addresses and GPS points can be aggregated into many different administrative and geographic units, it's possible to easily see how a customer or group of customers compares to different geographies—to their immediate neighbors; to the town or metro area; and even those across a state, province, or country. A map can also take behavioral, psychographic, and demographic data, which is often available at different scales and geographic areas, and standardize them. This makes it easier to compare customers across target segments and groups.

Using a map, retailers can not only understand how current and past response varies by geography but also how factors such as access and distance to retail centers, travel patterns, and proximity of competitors influence those responses. These factors can be combined with any time window such as time of day, day of the week, week of the year, holidays, and date ranges to develop intimate understanding of the retail landscape. Every customer, transaction, and interaction becomes a point that influences the hills and

valleys of opportunity and risk. Better still, the predictive surfaces and customer affinity scores can change in real time in response to new behaviors, conditions, and insights.

Location as a Service

LaaS is a new concept that combines the three main categories of cloud computing services—platform, infrastructure, and software as a service (SaaS).

- 1. *Location provides a platform* to develop, run, and manage analytics and embedded applications without the need to build similar analytics and data maintenance infrastructure into other enterprise apps and systems.
- 2. *LaaS is the infrastructure to manage, store, and distribute* location-specific data and capabilities between different departments and organizations. LaaS services are provisioned to be available and scale on demand while using the same enterprise identity management and security rules.
- 3. *LaaS delivers software and apps on a centrally hosted, subscription* basis that can be used by anyone in the entire organization anywhere, anytime, on any device.

LaaS includes the fundamental location technology, IT services, application programming interfaces (APIs), analytical capabilities, and end-user applications that retailers need. It can be deployed in on-premises, cloud, or hybrid forms that reduce much of the technological complexity. This means LaaS can be deployed quickly and used for specific purposes easily. If this is the case, costs can be shifted into departmental budgets, such as marketing or advertising. This helps the whole organization benefit and provides a means for LaaS to be something other than just another IT purchase.

A System for Understanding and Insight

Historically, people's interaction, including where and how, has been captured by different systems. This is because people go through many channels: social media, online apps, email, coupons, or brick-and-mortar stores. LaaS can collect this information and use a common denominator to bring it all together (location). This helps retailers discover trends and patterns that underlie consumer response and behavior by understanding not just the *who* and *what* but also the *why* and *where*.

LaaS can more widely leverage location data, analytics, and the insight created by combining the two. Retailers can develop new analytical methodologies around other business systems, as well as knowledge-focused workflows and on-demand analytics, using the specific lens of location.

LaaS makes location analysis an executable methodology within a retailer's core functions, delivering new value to and extending core business systems without encumbering them with the need to actually manage and analyze location data. It is delivered on an as-needed basis, scaling on demand to meet changing demands for analytics—permanent, temporary, or experiential—or as permanent services that absorb, enhance, and enrich data with unique analysis and insight.

When retailers use LaaS, they develop and execute more location-centric strategies to find out the potential customers they are missing. They can then reach them when and where they are most receptive. LaaS doesn't just work within other systems; *it is* a system for understanding retail.

A Seven-Step Plan for Implementing Location as a Service

Getting started with LaaS is not as complicated as many fear. LaaS meets the needs of business and IT executives to make it simple to add new value for the business from top to bottom. The technology has been designed as a platform. It already understands location data.

Instead of extending other systems to deliver and support services they were not designed for, LaaS can do this without the complexity and costly implementation. There is no need to develop new tools or require large-scale organizational change and new processes. Here are seven reasons retailers need to implement LaaS without high risk and costs.

■ **1—Match your products to the people who most want them.**

Behaviors are more than demographics. Customer insight comes from going beyond demographics into other insight about the retail population. Look at and analyze purchasing behaviors by also understanding psychographics and trip intent. LaaS offers a better way to identify the behavior and potential behind every transaction, purchaser, store, and delivery point using drive times and distance. Deliver the most appropriate tools to interpret, manage, and leverage this information by turning raw data into actionable insight that makes a real difference to the bottom line.

■ **2—Identify and measure real similarities and differences.**

LaaS contains statistical modeling tools and procedures that are specifically developed to exploit the geographic domain. These tools will appear familiar to BI and other enterprise system users. The difference is LaaS uses location attributes to quantify the degree to which a consumer is alike or different from their neighbor. Using spatially tuned techniques allows organizations to move into new forms of correlation, regression, and density analysis at a very low level of granularity. This helps them better understand customers and, more importantly, potential customers.

■ **3—Understand who, what, why, where, and when.**

LaaS turns transactions into quantitative analysis and hotspots, which help retailers identify real patterns over time and place. LaaS provides easy-to-use and powerful tools to seamlessly feed these analytics into other workflows.

■ **4—Figure out who's from where and why.**

LaaS services turn customer interactions and journeys into origin-destinations. Origin-destinations explain where people come from and go to in order to work, shop, and play. Distance and cost of travel are coupled with density models and hot spot analysis so retailers can study spatial distributions and understand what more customers want and expect.

■ **5—Turn mobile interactions into digisheds of consumer segmentation.**

By moving beyond where customers are from, LaaS provides services to better understand customer behaviors and needs as well as the degree of product penetration and affinity. Retailers can see which customers or products might be missing from their mix. In-store, online, and mobile behaviors can be connected

using where the interaction took place. Once you know the place, you can connect it to a household to gain local and regional insights. This creates a more precise understanding of the "journey to purchase."

■ **6—Turn segments into specifics.**

Every retailer is trying to understand customer behavior at a personal level. They are searching for a segment of one. Do this by moving beyond simply combining store performance data with customer demographics. Begin to understand each customer's behavior in time and space by using location. Knowing where and when customers shop in the real world can be done as easily as it is online. Restore confidence in segmentation strategies and improve margins across channels by unveiling hyperlocal details of customers. Location is the new cookie.

■ **7—Dynamically localize to maximize opportunity and demand.**

LaaS enables retailers to see their customers as they see themselves. This individual insight applies at all scales, from neighbors and neighborhoods to urban centers and ZIP codes all the way up to whole regions. With LaaS, retailers don't just change products; they change relationships.

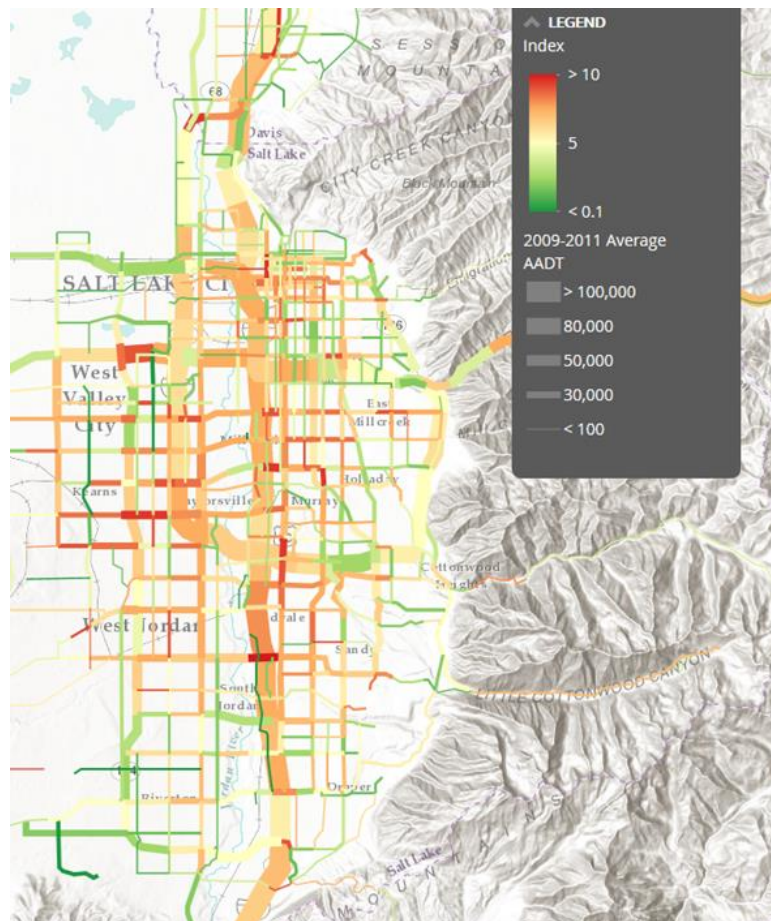
The Omni-location Channel

Consumers spend a lot of time on their smartphones, tablets, and computers researching and purchasing products. As discussed earlier, retail omni-channel strategies are both changing and responding to how and where customers want to shop. Better mobile apps and websites, coupled with improved and more integrated campaigns, continue to blur purchasing channel boundaries. Location-based data is generated for every search, page view, in-store price comparison, store transaction, or missed sale. If retailers properly adopt and apply this data, it gives better or new understanding of specific, individual customers, as well as entire consumer groups, because every transaction and interaction can be geolocated and analyzed in context.

Beyond the pajama-clad online purchase, coffee shop research, and email checked at the office water cooler or during the walk to lunch, location also provides new ways to understand other influences that affect shopper behavior and shopping. Every TV commercial, billboard, newspaper ad, coupon, or circular—every advertisement on the side of a bus, taxi, or street furniture or inside a train, at a station, or at a bus shelter—has a location, and consumers interact with them all the time, everywhere. They influence product knowledge, brand affinity, and retail demand with billions of dollars being spent monthly to gain eyeballs away from purely digital media.

Location analysis is being applied by retailers to purchase billboards not just in the most high-traffic retail centers but also along the routes that consumers travel by car, rail, bus, and train. By understanding where people live and how they travel between home and work, work and shopping, home and recreation, or any combination of these, a retailer can connect across many and different channels. For example, use geotargeting to put specific ads on TV, in newspapers, or on billboards along the routes that are most traveled by the target demographics. Similarly, display advertising on bus stops and even moving vehicles influence consumer behavior, and retailers can use location analysis to better manage their cross-channel campaigns or understand the impact that their competitors are having.

One European retailer recently analyzed where every one of its shoppers lived or worked and linked it to where they shopped. They used this to understand the most likely journey from origin to destination for every purchase including mode of travel and route to the store, from walking at lunch to rush hour commute by public transport or car. The pattern of flow was enhanced with understanding of the demographics of the customer's home for every journey, so the retailer could model how each customer was similar or different to any group of people traveling along the same route segment at any time of the day. In the example map below, daily traffic flow volume (cars per day) appears as varying line widths, while each road segment is colored by an index.



These powerful data aggregation and analysis techniques allowed the retailer to develop a very granular understanding of its customers' behavior and intent, which drove campaigns to geoconquest competition and negotiate the best prices for the best physical billboard sites and displays. The same techniques have been applied to TV and print media with equal success.

Geotargeting is a marketing strategy to use the location of a consumer to deliver different content based on his or her location. Any geographic scale can be used, from a country or city to an individual street or location such as a plaza or mall. Geotargeting is most effective at or below the ZIP code level and can be applied at the IP address or ISP level for online visitors.

Geoconquesting is hyperlocal geotargeting that differentiates one brand over its competitors through advertising within a specific distance of a place such as a store, mall, or public space. Geoconquesting delivers contextual, relevant advertising or promotions based on both the consumer's proximity to something and their intent. Geoconquesting often provides alerts or notifications to drive action or change behavior. For example, a fast-food outlet can use geoconquesting to detect that a customer is near a competitive location and incentivize the customer to come to the location a couple of blocks farther ahead instead.

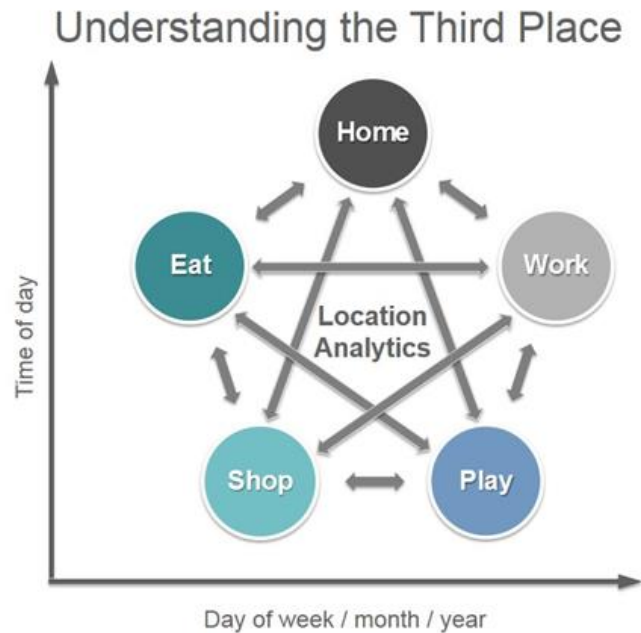
LaaS and Localization

Localization strategies have changed the way successful retailers do business. They understand that there is no magic bullet and that one size does not fit all. Localization is not so much a single strategy but a set of individual ones that can be tailored to specific locations and represent the needs and wants of local customers.

Today's consumers have a different expectation from the retail experience that existed only five years ago. Where consumers work, eat, shop, rest, and play changes based on time of day, season, weather, location, activity, budget, and aspiration. However, consumers want retailers to deliver a consistent, high-quality experience no matter where they are, both at a brick-and-mortar store and online.

Every aspect of localization fundamentally contains location, used in context. Location adds new understanding and connects the customer from evaluation to purchase as well as post-sale customer service and relationship management. Localization requires more than a focus on just merchandising and inventory management. It must include marketing, assortment planning, and store operations at a minimum. Refocusing a localization strategy based on the seven insights listed above results in increased sales and reduced in-store expenses because it has introduced localization. Here are the five characteristics of localization:

- Every place is different and individual.
- Merchandising, marketing, and the customer experience are defined by demographics.
- Hyperlocal marketing campaigns are tailored to local catchments and consumer origin and intent.
- Optimizing available distribution, products, and services saves money and time.
- Delivering the right product at the right place, right price, and right time drives customer affinity and long-term value.



The Need for a Location Strategy

Retailers have been investing in new data management and integration systems for the past few years, accelerating the focus on localization alongside new projects. They are doing this to handle the growing volumes, velocity, and variety of data linked to transactions, stores, marketing, products, and customers.

Many times, retailers have been somewhat shortsighted, focusing on features and functions in existing systems rather than the larger opportunities that come from a more holistic approach to location data and localization as a whole. A location strategy enhances the rate of success and reduces the time to value as retailers attempt to convert high volumes of consumers into long-term, high-value customers at faster and faster rates.

Consumer expectations continue to change, so retailers need a more sophisticated response if they truly want to impact the customer experience. One of the hardest things in business is not changing processes; it is changing mindsets. There have been thousands of discussions, articles, and conversations about localization and how new designs, processes, tools, and measures can help. Very few, if any, have put location at the center of the strategy.

It's time retailers started using real location insight.

Five Reasons to Implement a Retail Location Strategy with ArcGIS

ArcGIS® software is a location data management, analysis, and collaboration platform designed from the ground up to allow retailers to implement a location strategy and maximize the value and return on investment from the terabytes of location-rich data stored within enterprise systems. Following is a five-step guide to implementing a retail strategy right away with ArcGIS.

■ **1—Configure—Don't Code or Customize**

ArcGIS contains a suite of data access, analysis, and management tools that can expose geographic patterns and trends within individual datasets or break down the barriers between information silos. By using location to connect different systems and datasets to a common frame of reference, ArcGIS expands on retail art and science to enhance both the analytic and creative parts of the business.

■ **2—See and Understand Your Data in Context**

ArcGIS goes beyond simple maps and visualization tools. With specially designed yet easy-to-use statistical models, spatial analysis, and data enrichment procedures, retailers have access to new tools that turn charts and tables into quantitative analytics. It also includes a Living Atlas of the World—a constantly growing collection of authoritative data from Esri and its user community.

■ **3—Make Your Enterprise System Smarter at No Cost**

Apps, analysis templates, and workflows expand on BI, CRM, enterprise resource planning (ERP), and other enterprise tools to make it easy to create and share location intelligence and analysis with other departments, systems, executives, and partners or farther afield. ArcGIS is designed to manage location data and is the ideal destination to bring together data from other systems and maximize its value to the organization. Connectors allow data to be shared programmatically without the need to develop bespoke customizations. ArcGIS also includes application builders and APIs to create specialized systems where needed.

■ **4—Discover Insight That Delivers Real Business Impact**

Self-service analytics is changing the way retailers work and respond to the rapidly changing consumer marketplace. ArcGIS mapping tools are powerful yet simple to use, so everyone in an organization can apply analytics and make better decisions no matter what their role or position is. Data exploration and integration tools bring to light new kinds of insights and understanding.

■ **5—Share Knowledge and Collaborate Securely**

ArcGIS is a secure system with controlled access, so retailers can confidently provide users with what they need to get their job done while managing people and content based on role, privilege, and organizational status. ArcGIS delivers sophisticated tools to help everyone in the organization work more collaboratively and turn location-based data in solutions for a myriad of different needs.



Esri inspires and enables people to positively impact their future through a deeper, geographic understanding of the changing world around them.

Governments, industry leaders, academics, and nongovernmental organizations trust us to connect them with the analytic knowledge they need to make the critical decisions that shape the planet. For more than 40 years, Esri has cultivated collaborative relationships with partners who share our commitment to solving earth's most pressing challenges with geographic expertise and rational resolve. Today, we believe that geography is at the heart of a more resilient and sustainable future. Creating responsible products and solutions drives our passion for improving quality of life everywhere.



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