VAL⬤⬤RES

Incorporating Location Intelligence within Retail Organizations Case Studies Approach

The increased complexity of consumer behavior has given rise to an increased interest in emerging optimal business models. A higher level of consumer data has become an essential part of decision-making. VALOORES Crowd Intelligence System encompassing the analytics, technologies, UI, tools, methodologies and applications that analyze critical business data-helps businesses better understand their markets and make timely decisions.

"Valuable insights into customer preferences and interests, competitors and potential markets, are used to make strategic decisions; in this context, advanced LI can help CVS improve results and reach an excellent customer experience"

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Introduction

Retail location decisions have long represented major capital investment and therefore major risk for retail firms. These decisions range from store openings and closures, store expansions and renovations, to major acquisitions and disposals of entire store networks. Unlike many aspects of retail strategy that are dynamic and fast-changing, location decisions are long-term and binding. While it is relatively easy for a retailer to change pricing, product assortment or advertising, the bricks-and-mortar of store locations cannot be altered easily or quickly. With the growth in online retailing bringing changes to consumer behaviour, retailers have faced added pressure to adopt new data-centered methodologies when making location decisions.

The rapid growth in consumer-generated Big Data that are mostly sourced from various types of mobile devices and sensor technologies has placed increasing competitive pressure on retailers to leverage such data within their location decision-making practices. This paper examines the incorporation of Big Data within retail organizations.

"In our new health care model, we provide people access to more affordable care when, where and how they need it."

By using conventional methods, retailers only understand half of a customer's journey. With location data, they can see the full picture. Location Intelligence provides visibility into what is taking place outside of a retailer's four walls, showing where customers go before and after visiting a store, where else they shop, how far they travel to reach a store, and so much more.

Retailers don't have to rely only on hardware installed in stores, such as beacons or cameras, in order to understand consumer behaviors. As the use of mobile devices has become universal (with 84% of the world's population now owning smartphones), the volume of data from mobile devices has skyrocketed (45% of consumers use their phones for in-store price comparisons, and 65% of consumers have retailer applications on their phones).

Customer records appended with location attribution can produce greater insights into targeting, acquisition, and retention and improve profitability. Analytics help to understand who your customers are in terms of location demographic profile and buying habits, behaviors and lifestyle, where one lives and shops, etc. Analytics also help evaluate whether you are targeting the right customers and the right locations in marketing activities.
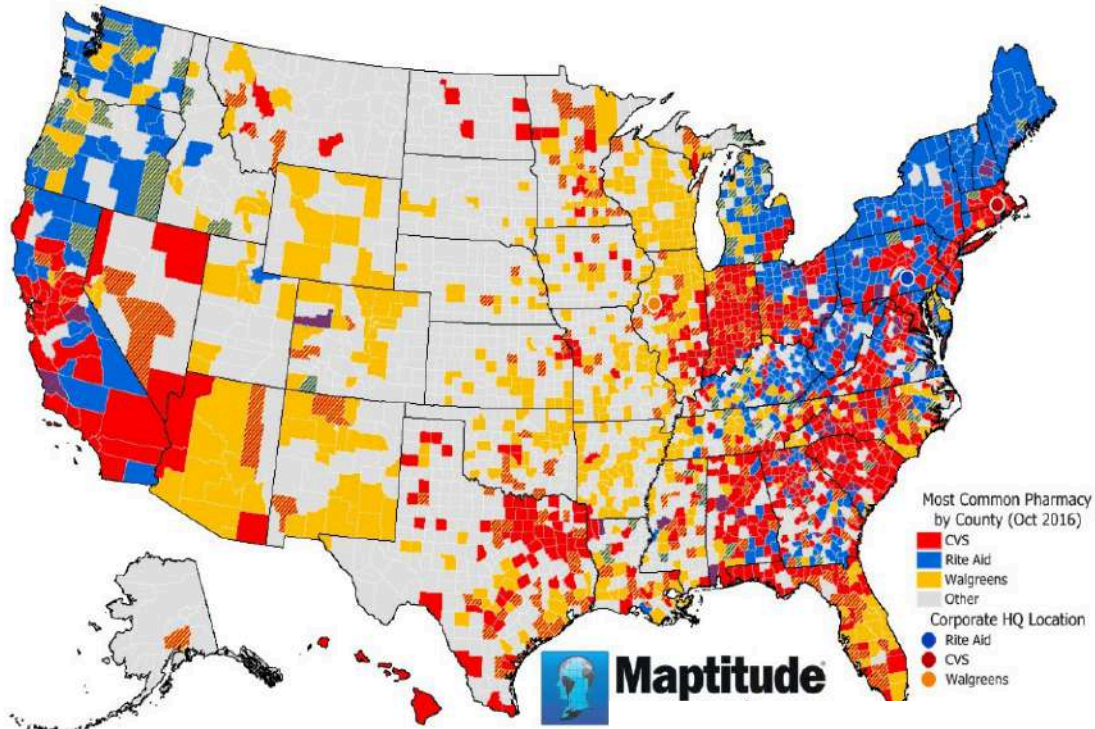
CVS and its competitors' dominance in the U.S.

The benefits of Location Intelligence for retail Businesses

1. ***Targeted Marketing***
    Location intelligence allows retailers to understand the demographics and behavior of their target customers in different areas. This enables them to create targeted marketing campaigns and personalized promotions to drive customer engagement and increase sales.

2. ***Optimal Site Selection***
    By analyzing geographical data, retailers can identify the most suitable locations for new stores or branches. Factors such as population density, competition, and proximity to target customers can be considered to make informed decisions about site selection.

3. ***Customer Segmentation***
    Location intelligence helps retailers segment their customer base based on geographical factors. This allows for more personalized marketing strategies and product offerings tailored to the specific preferences and needs of customers in different locations.

4. **Improved Store Performance**
    Retailers can analyze location-based metrics to evaluate the performance of their stores. This includes foot traffic, sales conversion rates, and customer behavior. By identifying high-performing stores and understanding the reasons behind their success, retailers can replicate strategies and optimize underperforming stores.

5. **Enhanced Supply Chain Management**
    Location intelligence provides insights into optimizing the supply chain and distribution networks. Retailers can identify the most efficient routes for product delivery, minimize transportation costs, and optimize inventory levels to ensure timely availability of products.

6. **Competitive Analysis**
    Retailers can leverage location intelligence to gain insights into their competitors' store locations and market presence. This information helps them identify gaps in the market, evaluate competitor strategies, and differentiate their offerings to gain a competitive edge.

7. **Real-time Market Monitoring**
    With location intelligence, retailers can monitor market trends and changes in customer behavior in real-time. This allows for agile decision-making and quick adjustments to marketing strategies or product offerings based on local market dynamics.

8. **Customer Journey Mapping**
    By analyzing location data, retailers can gain a deeper understanding of their customers' journeys and touchpoints. This helps identify areas of improvement, optimize store layouts, and create seamless omnichannel experiences that meet customer expectations.

9. **Expansion and Growth Strategies**
    Location intelligence provides valuable insights for retailers looking to expand their operations or enter new markets. It helps identify untapped markets, understand the local consumer landscape, and develop effective growth strategies based on comprehensive market data.

10. **Footfall Visualisation**
    Allows businesses to observe trends, track changes over time, and make data-driven decisions. It helps identify opportunities for growth, optimize operations, and enhance the overall customer experience.By visualizing footfall data, businesses gain a comprehensive understanding of customer behavior and can leverage this information to

improve efficiency, maximize sales, and enhance the overall performance of their physical spaces.

11. Securing Shoplifting

VCIS Geospatial intelligence offers robust solutions for bolstering security measures against retail shoplifting. VCIS allows retailers to analyze shoplifting incidents by location, aiding in resource allocation and store optimization. Predictive analytics forecasts theft patterns, enhancing proactive security efforts. Real-time monitoring equipped with geospatial capabilities detects suspicious behavior, enabling swift responses.Our solution integrates with inventory case management, facilitating real-time item tracking and alert triggers. Our map Visualization assists in decision-making regarding security measures by analyzing customer flow and product placement, retailers can create layouts that maximize visibility and minimize blind spots. They can also use geospatial data to identify exit points and implement additional security measures near those areas. Communication and collaboration among retailers are facilitated through VCIS; they can share information about known shoplifters or suspicious

individuals, enabling a collaborative approach to security. This information sharing can help retailers better prepare for potential threats.

12. Consumer Risk Based

Location intelligence can link consumer risk factors to shoplifting behavior by analyzing geographic, temporal, and demographic data. It helps identify shoplifting hotspots, peak times for theft, and areas with a higher concentration of individuals facing specific risk factors. Retailers can use this information to tailor loss prevention strategies, improve store layouts, and implement real-time monitoring and alerts. Community organizations can target at-risk areas with intervention and support programs, addressing the underlying issues contributing to theft.For example, VCIS identifies risks for certain consumers coming from high risk areas or doing abnormal activities or were present on days when shoplifting cases happened. Overall, location intelligence enhances our understanding of shoplifting dynamics and informs targeted strategies for prevention and intervention.
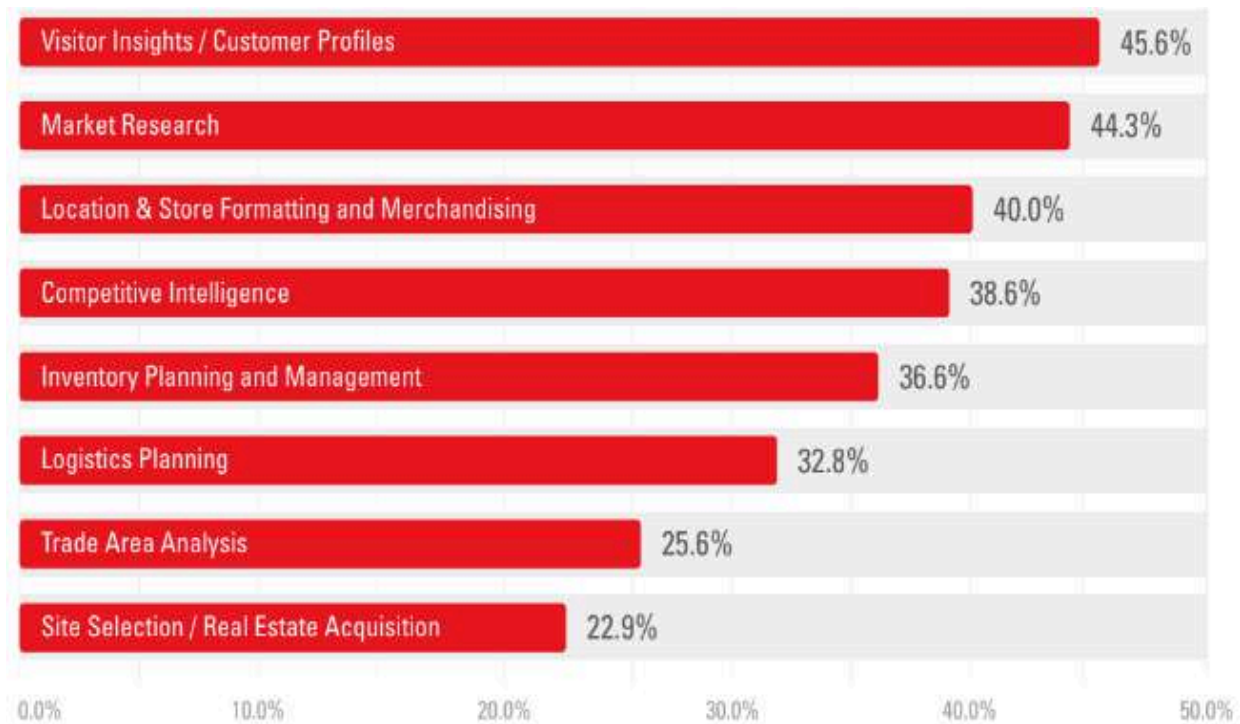
Leveraging Location Intelligence

Consumer behavior data, when integrated with location intelligence, is proving to be valuable across diverse applications. This powerful combination allows businesses to gain insights into customer preferences, shopping patterns, and demographic trends based on their physical location. From targeted marketing campaigns and personalized offers to optimizing store locations and supply chain management, the utilization of consumer behavior data with location intelligence offers numerous possibilities for businesses to enhance decision-making and better cater to the needs of their customers.

1. **Location intelligence is being utilized in a broad range of scenarios to analyze consumer behavior data.**

Which of the following use cases for consumer behavior data centered around location intelligence are most critical to your organization?

Visitor Insights / Customer Profiles — 45.6%
Market Research — 44.3%
Location & Store Formatting and Merchandising — 40.0%
Competitive Intelligence — 38.6%
Inventory Planning and Management — 36.6%
Logistics Planning — 32.8%
Trade Area Analysis — 25.6%
Site Selection / Real Estate Acquisition — 22.9%

2. Data leaders recognize the significance of the insights enabled by location intelligence and consider them crucial for making informed business decisions.

What insights from location intelligence are most critical to your organization's business decisions?
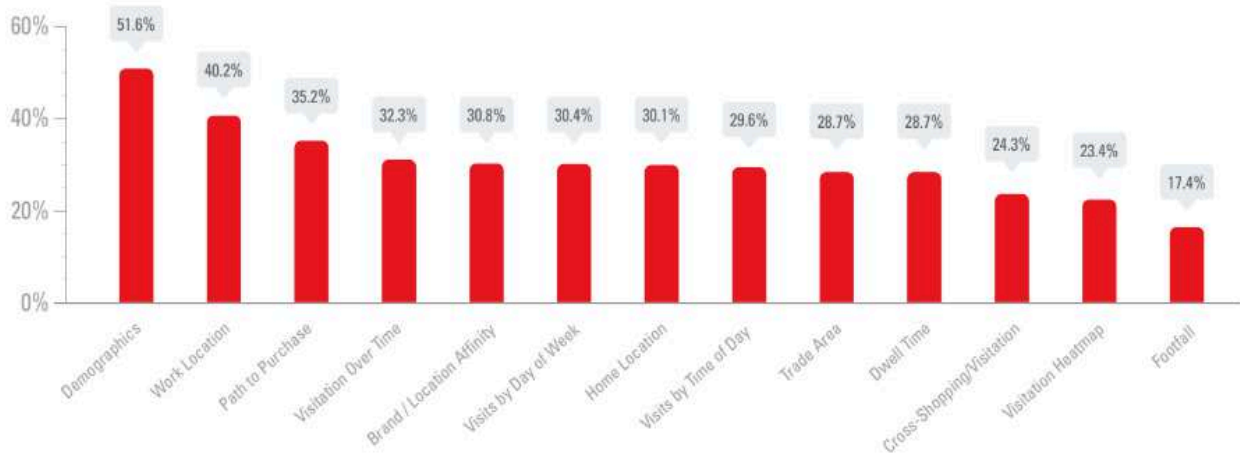
3. For metrics to optimize in 2023, growing footfall, improving customer experience and driving online sales were top of mind.
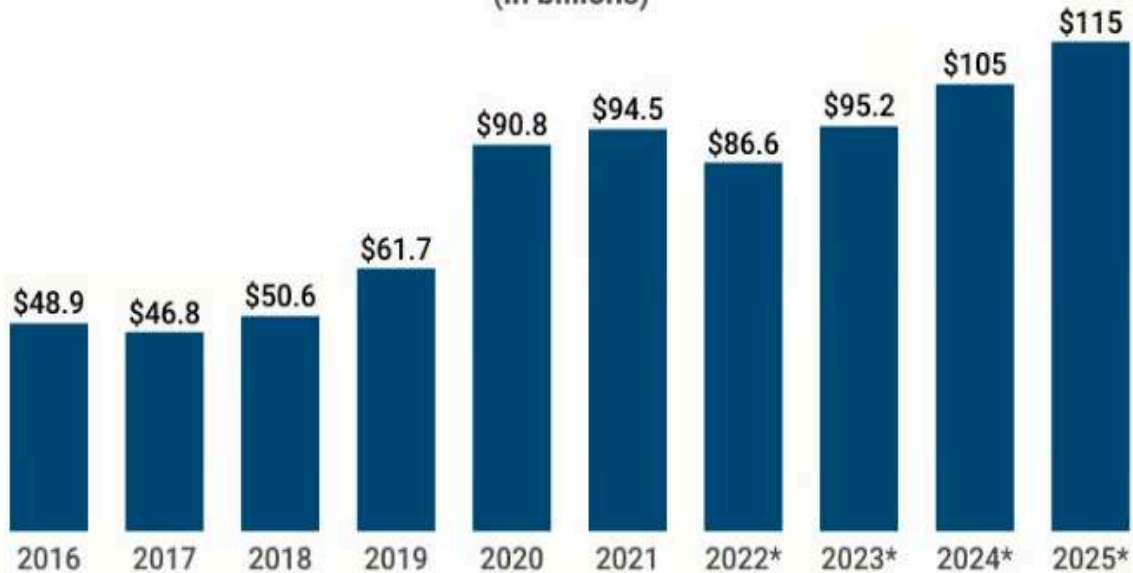
Which of the following metrics are most important for your team to improve in 2023?
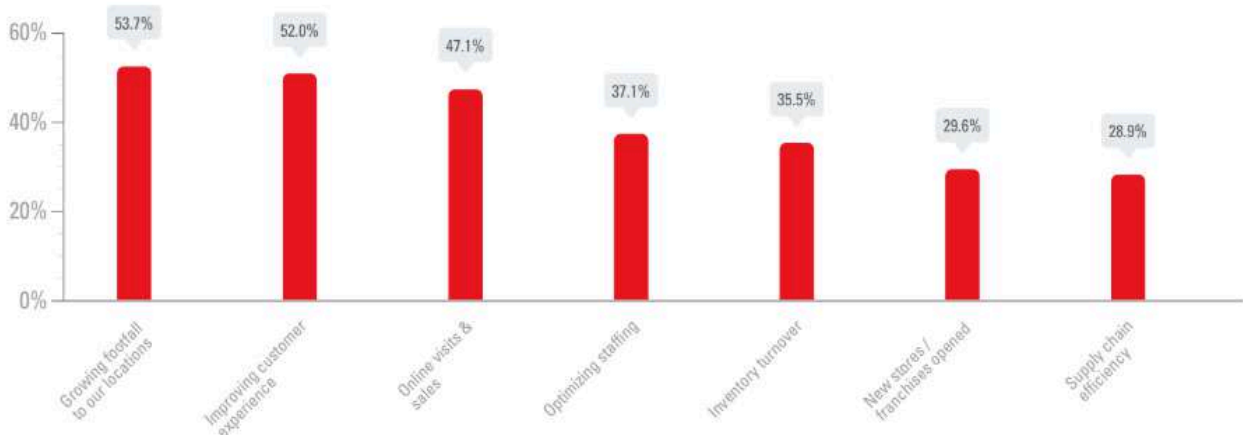
4. Stores lost an estimated $86.6 billion to retail theft in 2022; projections indicate that in 2025, retail theft may cost stores over $115 billion.

Retail Sales Revenue Lost to Theft
(in billions)

Year	Amount
2016	$48.9
2017	$46.8
2018	$50.6
2019	$61.7
2020	$90.8
2021	$94.5
2022*	$86.6
2023*	$95.2
2024*	$105
2025*	$115

Source: National Retail Federation

* Projections based on source data

Case Study 1 - Competitor Analysis and Consumers' Behaviors

The intention behind examining the customers' behaviors and lifestyle factors is to gain insights into the unique value propositions or advantages that attracted customers to Pharmerica or Walgreens despite the presence of CVS in close proximity.

By analyzing these factors, CVS could better understand the needs and preferences of these customers, enabling them to tailor their offerings accordingly. This analysis would ultimately help CVS strengthen its competitive position in those specific regions and enhance customer satisfaction.

N.B: In this case study, we identified *Pharmerica* *and* *Walgreens* *as direct competitors for CVS.*

1. **"Device History Pattern"**

We executed a "Device History Pattern" query of a Pharmerica store over a period of two weeks; the purpose of this query was to analyze the travel patterns of customers and determine the regions from which the majority of customers were originating.

The screenshot below shows the specified Pharmerica store with all the related hits. *(DHP Pharmerica)*
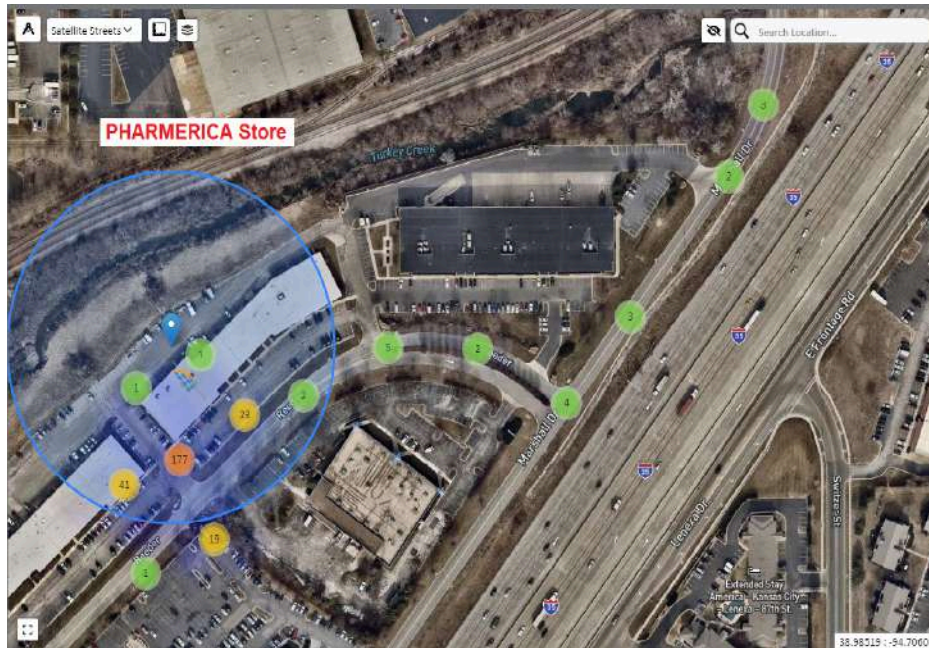
As we zoom out the map screen, we get a clearer picture of the hits trajectory on their way towards Pharmerica store as seen in the screenshot below:

As we follow the hits' trajectory, we discovered that most of the hits are originating from a region where a CVS store is available, yet they chose to go to Pharmerica instead; despite the longer distance.
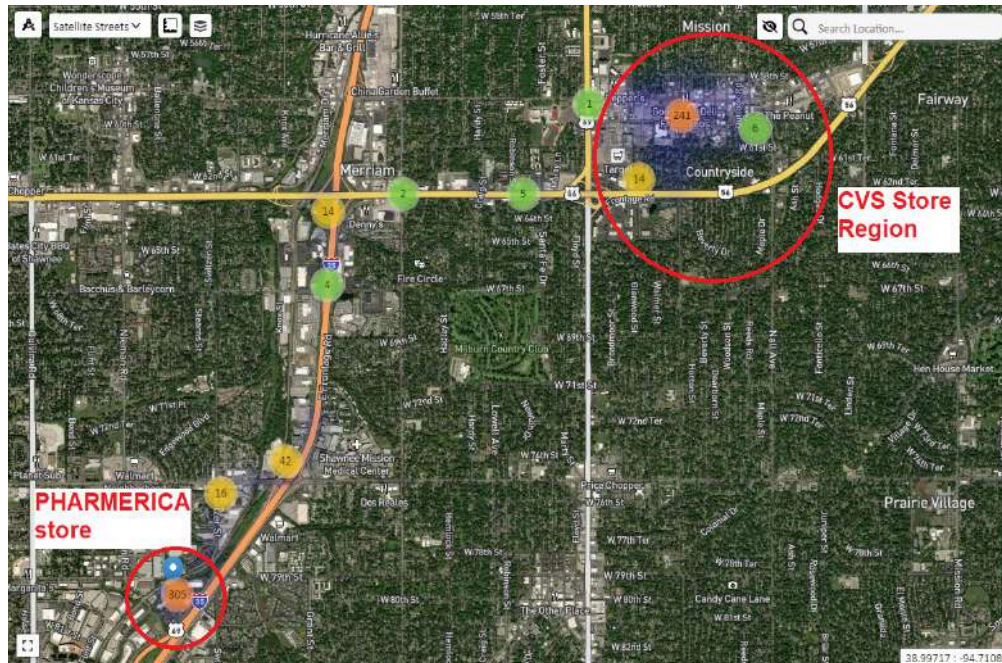
Upon analyzing the data, it was discovered that a significant number (29%) of customers were coming from specific regions. Interestingly, despite the presence of a nearby CVS store in these regions, customers were still choosing Pharmerica's services.

Upon recognizing this trend, the system generated a notification to prompt further investigation into the customers' behaviors and lifestyles specifically related to this topic.

The objective of this notification was to delve deeper into understanding why customers in these regions were opting for the Pharmerica's services over the more convenient option of the nearby CVS store.

2. "Device Travel Pattern"

There can be several reasons why customers visit a store right after being at a similar store that sells the same nature of products:

- *Price Comparison*
- *Product Variety*
- *Service Experience*
- *Loyalty Programs or Discounts*

Using our "Fixed Element" and "Bulk Draw" features, we selected two CVS stores *(CVS store 2, CVS store 4 and Walgreens 4)* for a diameter of 100 meters.
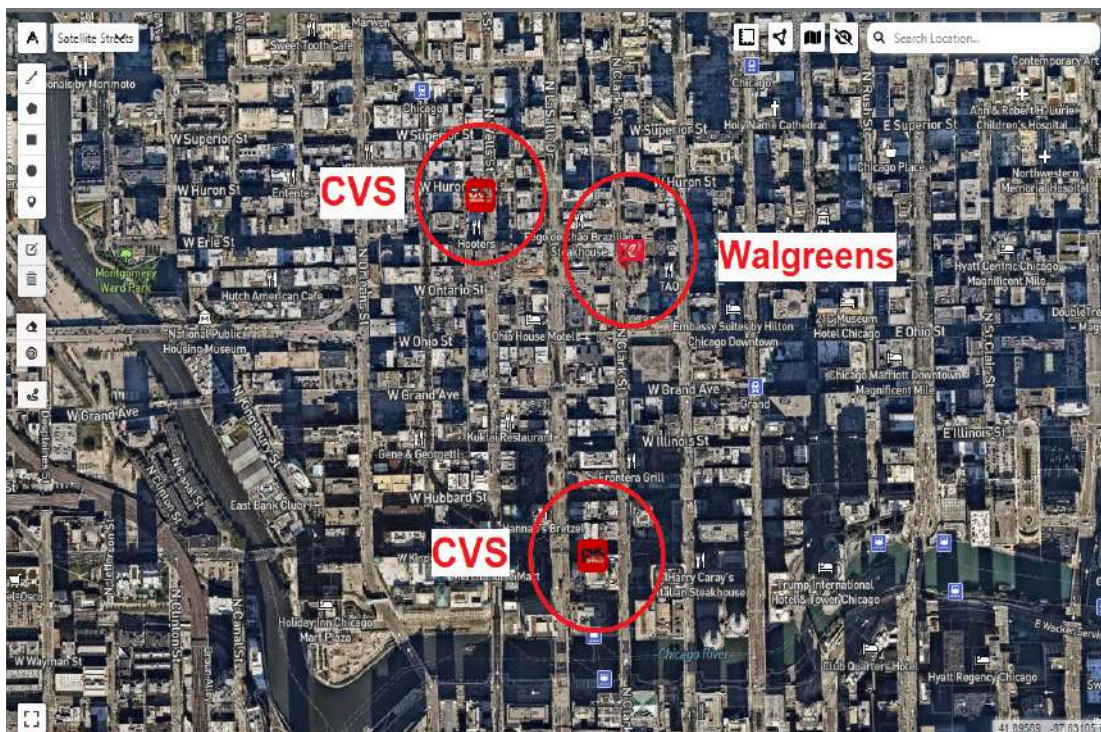
Several "Device Travel Pattern" queries involved analyzing the travel patterns of devices associated with customers visiting both CVS branches and Walgreens branches.

By examining the data collected from these devices, the aim was to gain insights into customer behavior and understand the frequency and magnitude of such visits.

a. A "Device Travel Pattern" query is executed over the three fixed elements mentioned above, by only one click; the purpose of this query was to identify instances where customers visited a CVS branch and then proceeded to visit a Walgreens branch in close proximity.
*(DTP Case Study 1 - Scenario 2)*

It turned out that one of the customers who frequented a CVS branch had visited, on February 25, another branch for CVS before going to Walgreens on the same day.
This pattern indicates an almost certain possibility that:

- This customer prefers to buy from CVS stores, as he visited two of its branches before resorting to a competitor.
- This customer had not found the product he needed at CVS stores.

b. A "Device Travel Pattern" query is executed over a CVS store and a Walgreens store for around a four months period *(CVS store 2 and Walgreens 6)*. The purpose of this query was to track any customer, who used to frequent one of CVS stores periodically, and had moved to shop permanently with Walgreens and stopped visiting CVS stores. *(DTP 2 Case Study 1 - Scenario 2)*
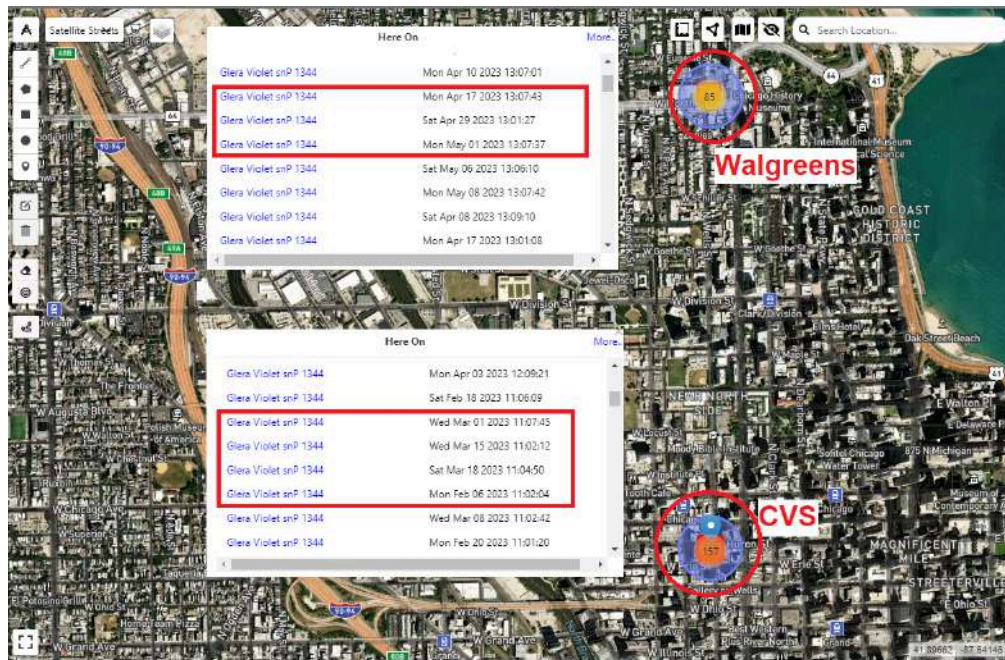
It turned out that one of the customers who frequented a CVS branch constantly during February and March had moved to shop at a Walgreens store nearby during April and May without coming back to CVS.

This pattern indicates an almost certain possibility that this customer had experienced one or more of the following:

- Product unavailability at CVS
- Better loyalty programs, rewards and offers at Walgreens
- Limited product selection at CVS
- Price difference
- Poor Customer service

c. Another "Device Travel Pattern" query is executed over a CVS store and a Walgreens store *(CVS store 2 and Walgreens 5).* The purpose of this query was to track any customer, who used to frequent one of Walgreens stores periodically, and had moved to shop permanently with CVS and stopped visiting Walgreens stores. *(DTP 3 Case Study 1 - Scenario 2)*
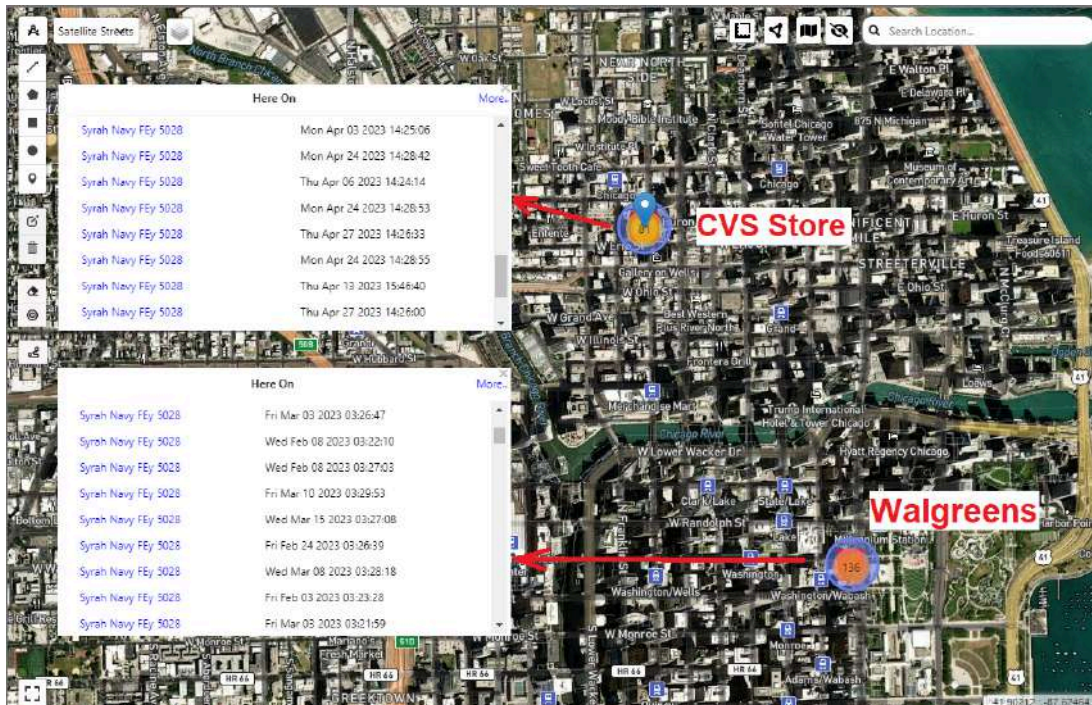
The results showed that one of the customers who frequented a Walgreens branch constantly during February and March had moved to shop at a CVS store nearby during April and never came back to Walgreens. This pattern indicates an almost certain possibility that this customer had experienced a better service at CVS or the loyalty programs, rewards and offers at CVS are very good, which the company must take into consideration as a catalyst to attract customers in other branches.

Case Study 2 - Targeted Advertising

Consumers shop within different channels: they might visit the four wall stores and shop directly, or approach to look at products and then buy online, or they search for a product online and then buy it in a nearest store. The complicated retailers are now closely examining the interplay between offline and online customer decision journeys. They're taking an omnichannel view of store performance allowing each store to "get credit" for all the sales in which it played a role, whether those sales happened offline or online. In doing so, retailers are getting a more accurate picture of each store's total economic value and making better decisions about their optimized presence. The key indicator? VALOORES Location intelligence analytics.

N.B: In this case study we chose "Walgreens" and "Pharmerica" as a competitor.

1. "Activity Scan"

Using our "Fixed Element" and "Bulk Draw" features, we chose a specific CVS store *(CVS store 3)* with a diameter of 100 meters for analysis.We conducted three Activity Scan sessions, each covering a distinct time frame.

The purpose of these queries was to compare the density of the store during different periods. By analyzing the footfall data and customer activity, we aimed to gain insights into how the store's density varied over time and identify any patterns or trends that may inform decision-making or optimization strategies.

By understanding the fluctuations in store density, we could potentially uncover factors influencing customer behavior and make informed adjustments to enhance the store's performance.

a. Weekdays

Store density during weekdays can vary significantly depending on factors such as location, working hours, and even seasonal variations. CVS can use location intelligence and analytics tools to gather specific data on store density during weekdays, helping them optimize staffing levels, inventory management, and marketing strategies accordingly. *(Activity Scan CVS Weekdays)*
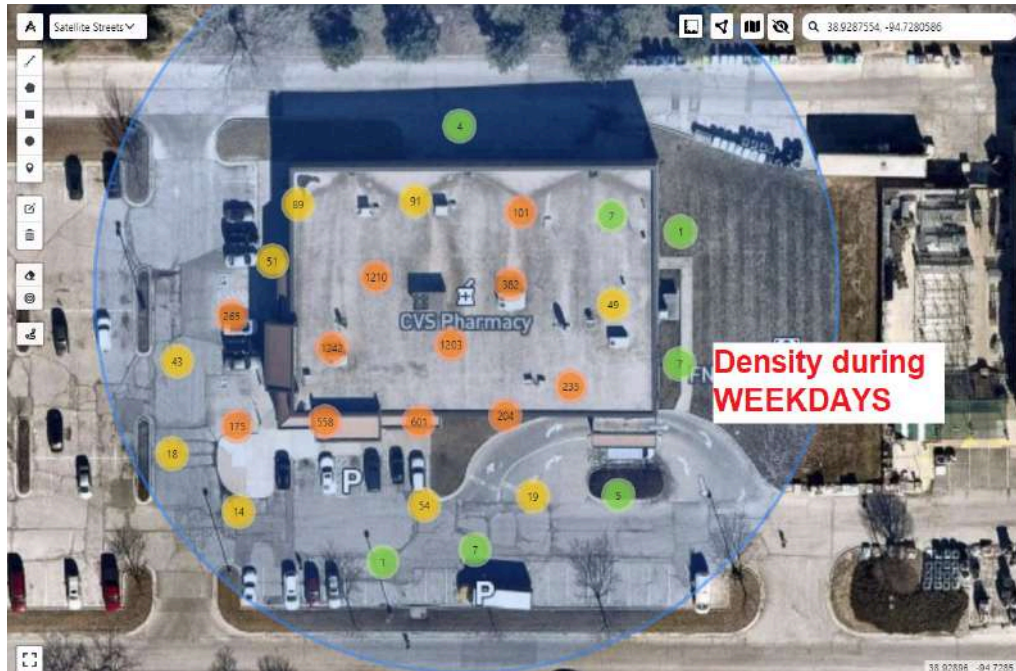
b. Weekends

The store's density during weekends can differ from weekdays due to variations in consumer behavior and priorities. Generally, weekends tend to be busier for retail stores compared to weekdays due to factors like people having more free time, family outings, and increased social activities. However, the actual store density can vary significantly depending on the specific circumstances.
*(Activity Scan CVS Weekends)*
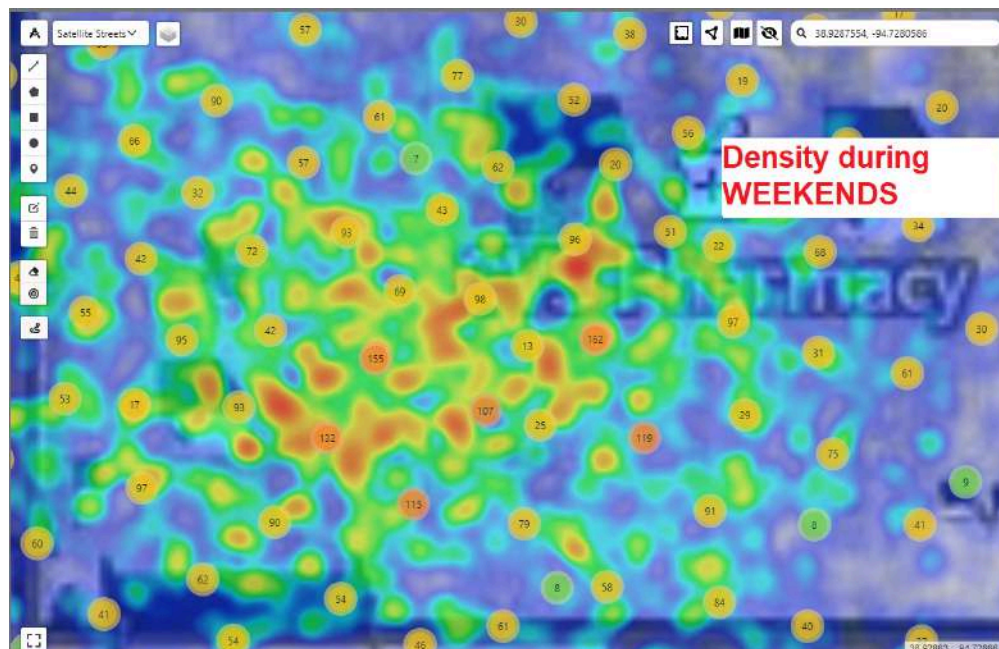
c. Promotion Days

The actual density of a store during promotion days can vary significantly depending on the specific circumstances and the popularity of the promotion. Some promotions may attract a moderate increase in customers, while others, especially those involving highly sought-after products or significant discounts, can result in large crowds and high store density.
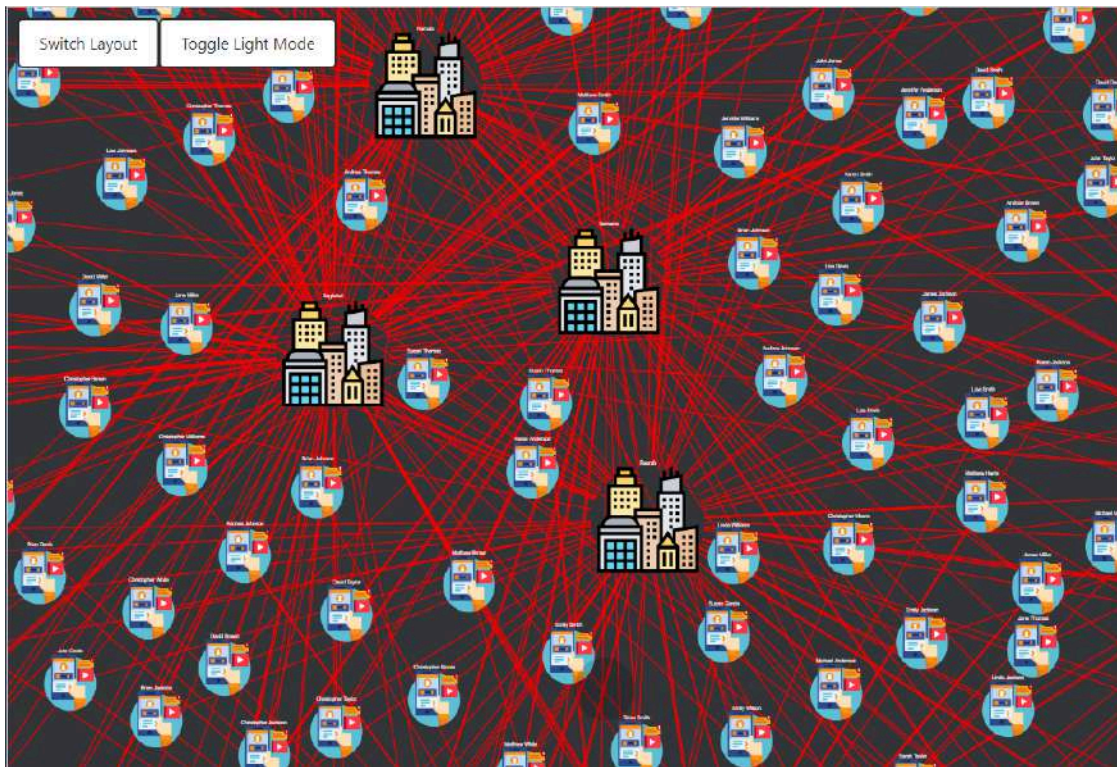*(Activity Scan CVS Weekends)*
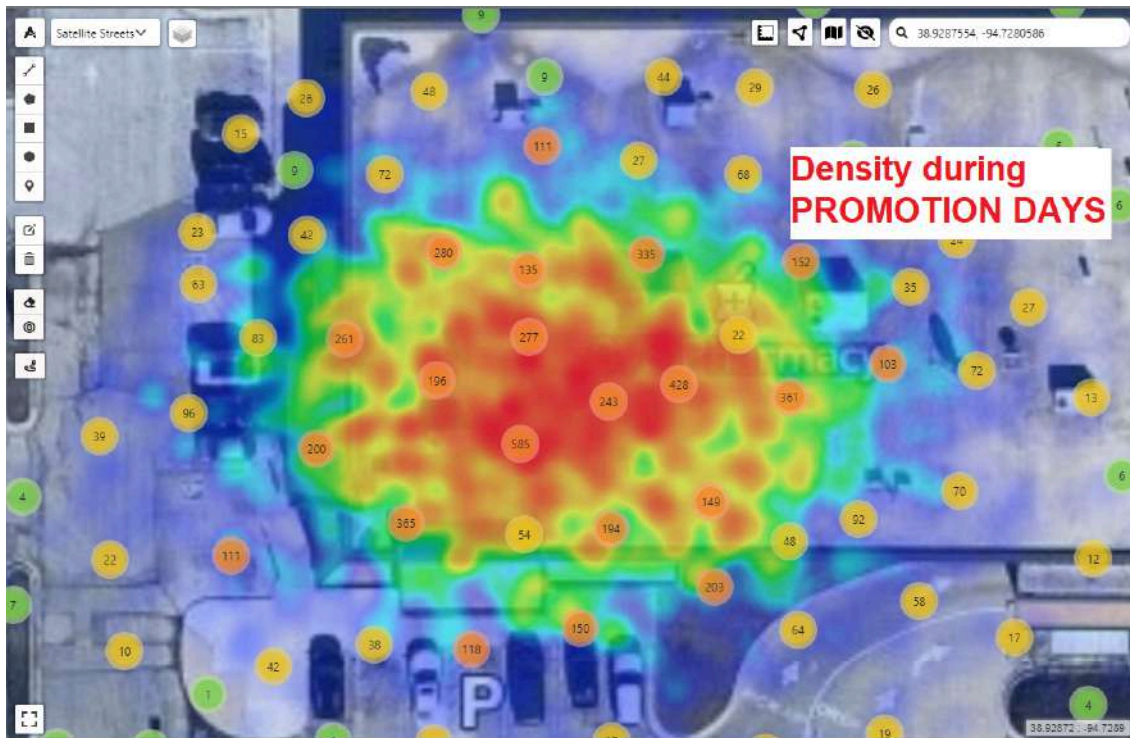
2. Knowledge Graph

A knowledge graph for the retail industry would capture and organize information relevant to the domain. By structuring and interconnecting this information in a knowledge graph, retail businesses can gain valuable insights, support dec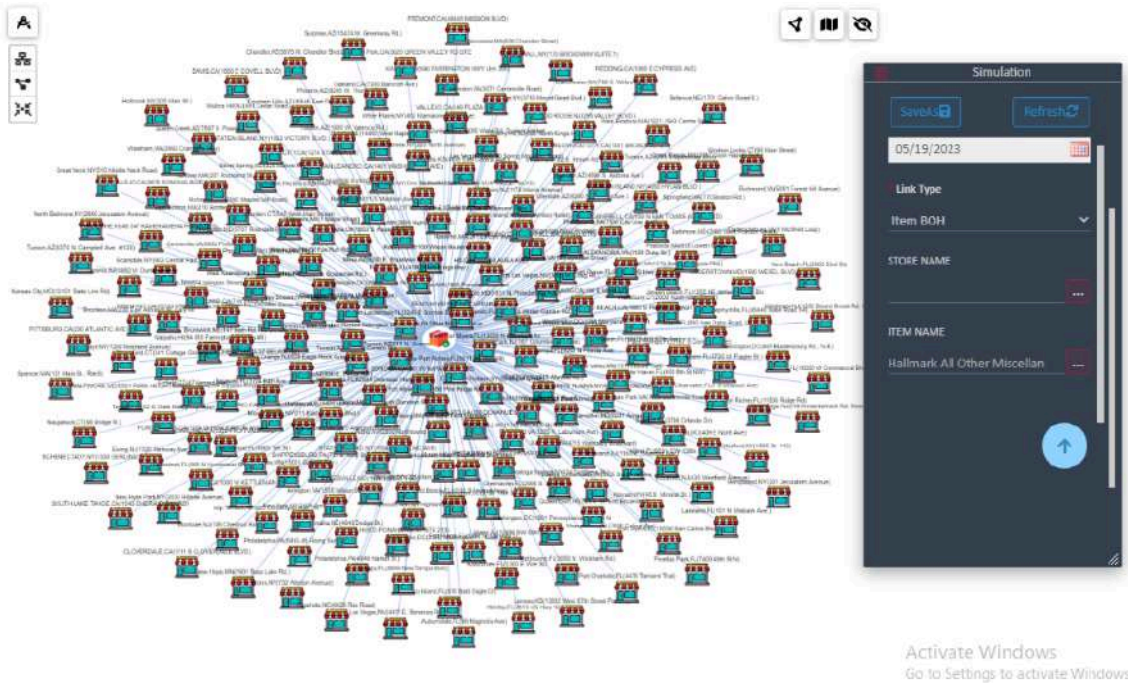ision-making processes, enhance customer experiences, and optimize operations. The knowledge graph can be queried, analyzed, and utilized by VALOORES Crowd Intelligence System to extract meaningful knowledge from the data.

Here are some key components and examples of what a knowledge graph for retail could include:
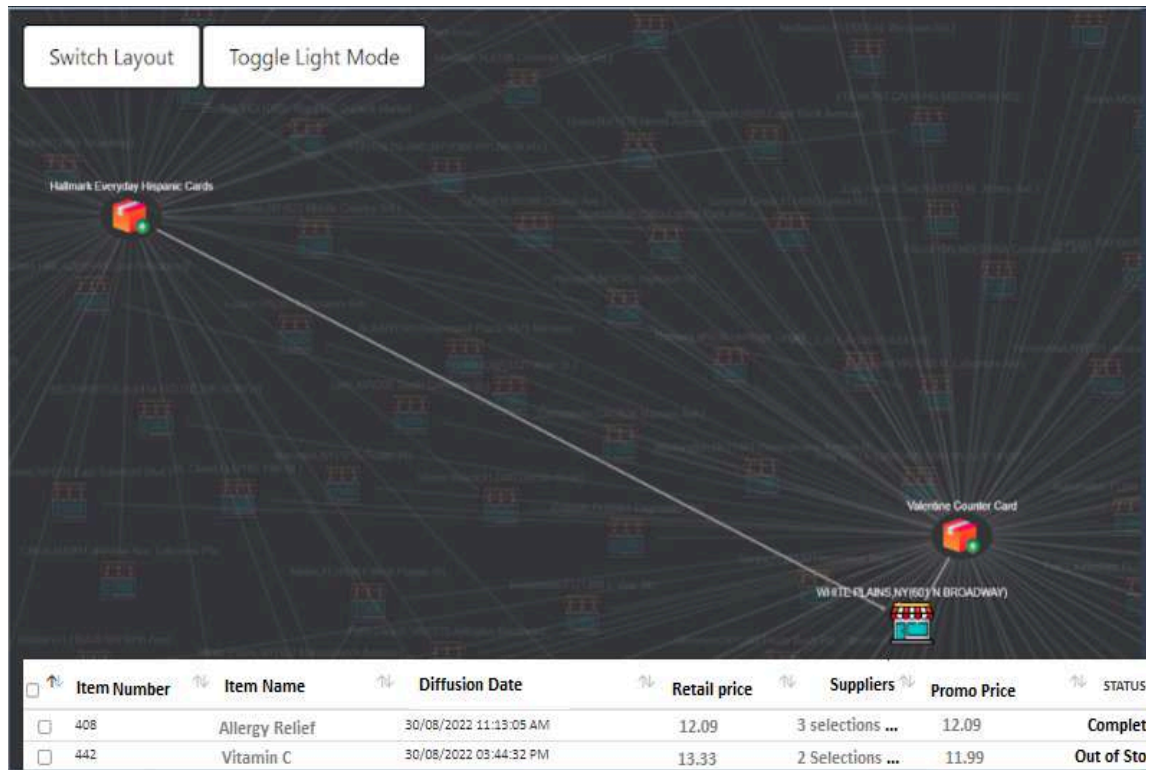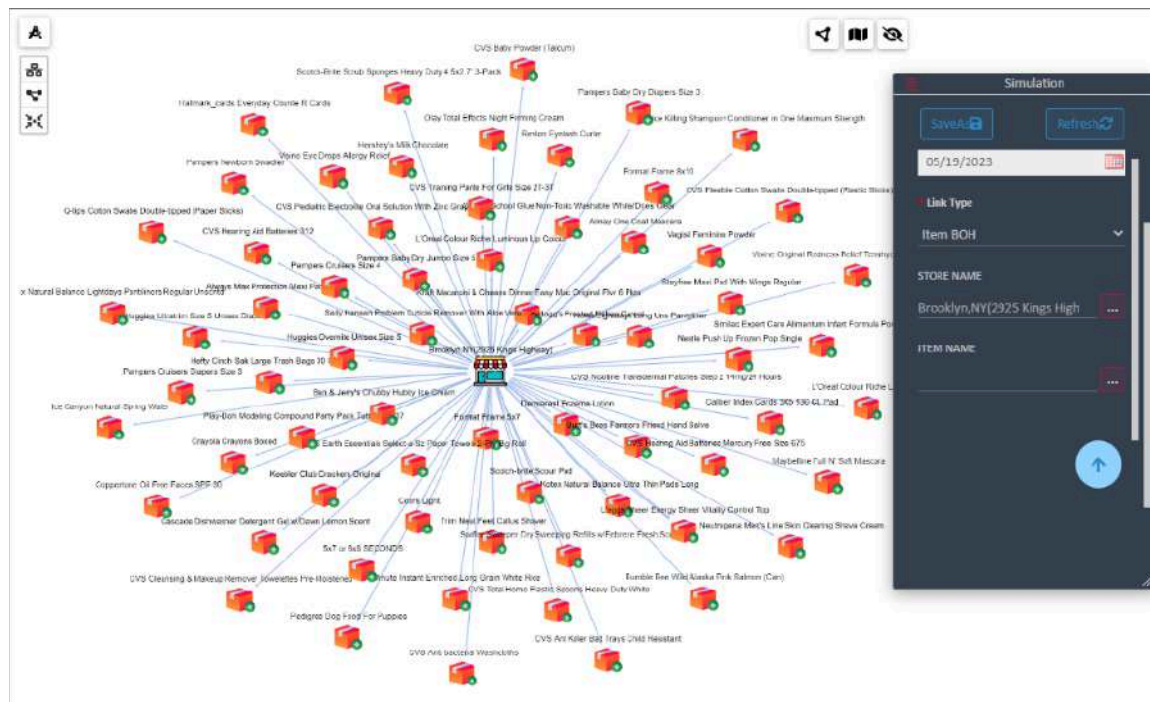
- Customers

- Item - Stores Diffusion

● Drill down by Item information

	Item Number	Item Name	Diffusion Date	Retail price	Suppliers	Promo Price	STATUS
☐	408	Allergy Relief	30/08/2022 11:13:05 AM	12.09	3 selections ...	12.09	Complet
☐	442	Vitamin C	30/08/2022 03:44:32 PM	13.33	2 Selections ...	11.99	Out of Sto

● Items Availability

3. Dashboard

KPI dashboards for retail are visual representations of key performance indicators that track and measure the performance of various retail metrics. These dashboards provide an overview of important data points and insights to help CVS monitor their business performance and make informed decisions. A common dashboard content component for a retail store is "Customer Metrics" to track customer-related metrics, such as total number of customers, new customers acquired, customer retention rate, and average purchase value. This provides insights into customer behavior, loyalty, and overall customer satisfaction.

Some common KPIs we prepared include:
- Customers movements visiting CVS stores
- Customers movements visiting competitor stores
- CVS vs Competitor Total Customers/day view
- Percentage of Increase/decrease In different stores Visitors
- CVS store Occupation in a Competitor area

- Allocation and performance dashboard

To note that, the specific content and metrics on a retail dashboard may vary depending on the store's goals, strategies, and industry. It's essential to tailor the dashboard to align with the specific needs and priorities of the retail business.

If we take the CVS Number of Customers KPI as an example, it holds immense importance as it provides valuable insights into customer behavior, store traffic patterns, and overall business performance. By tracking the number of Customers KPI, CVS can gauge the effectiveness of their marketing efforts, assess the impact of promotions or discounts, and evaluate the success of new product launches. Additionally, this KPI helps CVS identify customer trends, understand peak shopping days, optimize staff scheduling, and make data-driven decisions to enhance the customer experience.

Case Study 3 - New Stores Analysis

To identify a suitable area for a new CVS store, several factors need to be considered.

1. ***Market Analysis:*** Conduct a thorough market analysis to understand the demographics, population density, income levels, and consumer behavior in different areas. Look for areas with a sufficient customer base and a potential for growth.

2. ***Competition Analysis:*** Identify existing competitors in the area, such as other pharmacies or retail stores. Evaluate their locations, market share, and services they offer. Consider areas where there is a gap in the market or an underserved population.

3. ***Accessibility:*** Look for areas with good accessibility, including proximity to major roads, public transportation, and parking facilities. Ensure that the location is easily reachable for customers and has sufficient infrastructure to support a retail business.

4. ***Demographic Factors:*** Consider the demographic profile of the target customer base. Look for areas with a higher concentration of your target demographic, such as families, seniors, or college students, depending on your store's focus.

5. ***Population Density:*** Assess the population density of different areas. Higher population density generally translates into a larger customer base and more foot traffic. Look for areas with a balance of residential and commercial properties.

N.B: *In this case study, we identified* <u>*Walgreens*</u> *as a direct competitor for CVS.*

As shown in the screenshot below concerning the distribution of CVS and Walgreens stores in New Orleans; it is clear that the south side of the river lacks stores.
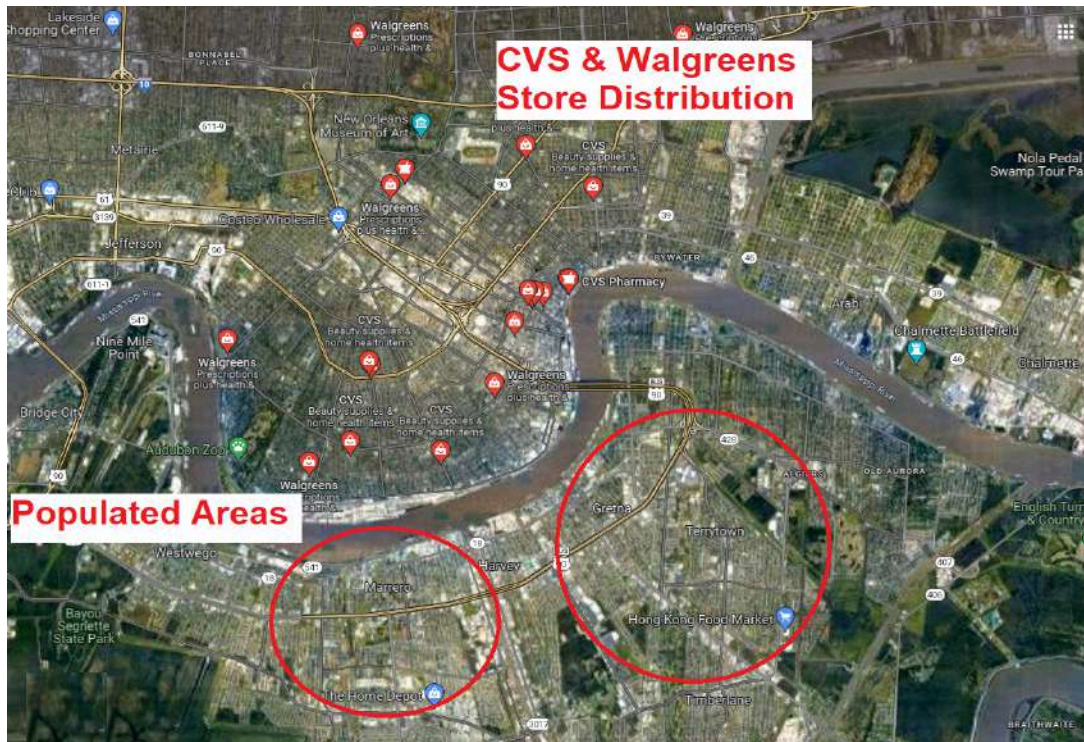

Opening a new CVS store in Algiers, New Orleans holds immense potential for several reasons. Firstly, Algiers is a vibrant and diverse neighborhood with a growing population, making it an ideal location to cater to a large customer base. Secondly, the area has a significant demand for convenient healthcare services, and CVS's presence can provide easy access to prescription medications since there is a hospital in the area. Additionally, Algiers is home to numerous residential communities, schools, and businesses, ensuring a steady flow of customers. The proximity to major transportation routes and the ferry terminal further enhances accessibility for residents and commuters.

We took "Algiers" as an example; it presents an ideal opportunity for opening a new retail branch. With its diverse population and thriving community, Algiers offers a vibrant customer base ready to support a new retail venture. The area boasts a significant population, including families, young professionals, and students,

providing a broad demographic range for potential customers. Moreover, Midtown is home to several well-established schools, attracting a consistent flow of parents and students seeking convenient shopping options. Additionally, the presence of a hospital in the vicinity indicates a demand for healthcare-related products, making it a prime location for a retail branch offering health and wellness goods. The combination of a robust population, educational institutions, and an existing hospital network positions Algiersas an optimal choice for a new retail branch. *(CVS - Activity Scan New Orleans)*
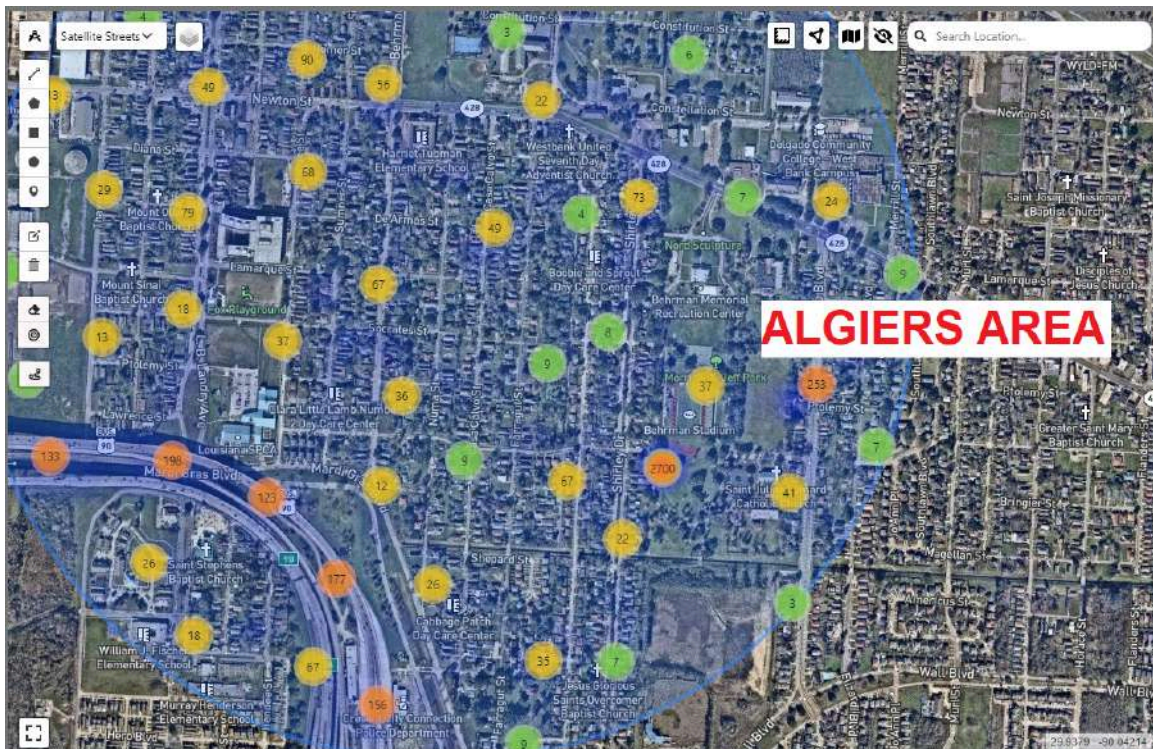
Application walkthrough

Using the map explorer module, users can execute different business scenarios, based on predefined criteria, or VCIS

machine learning algorithms within alert management and Dynamic Business Rule Engine.
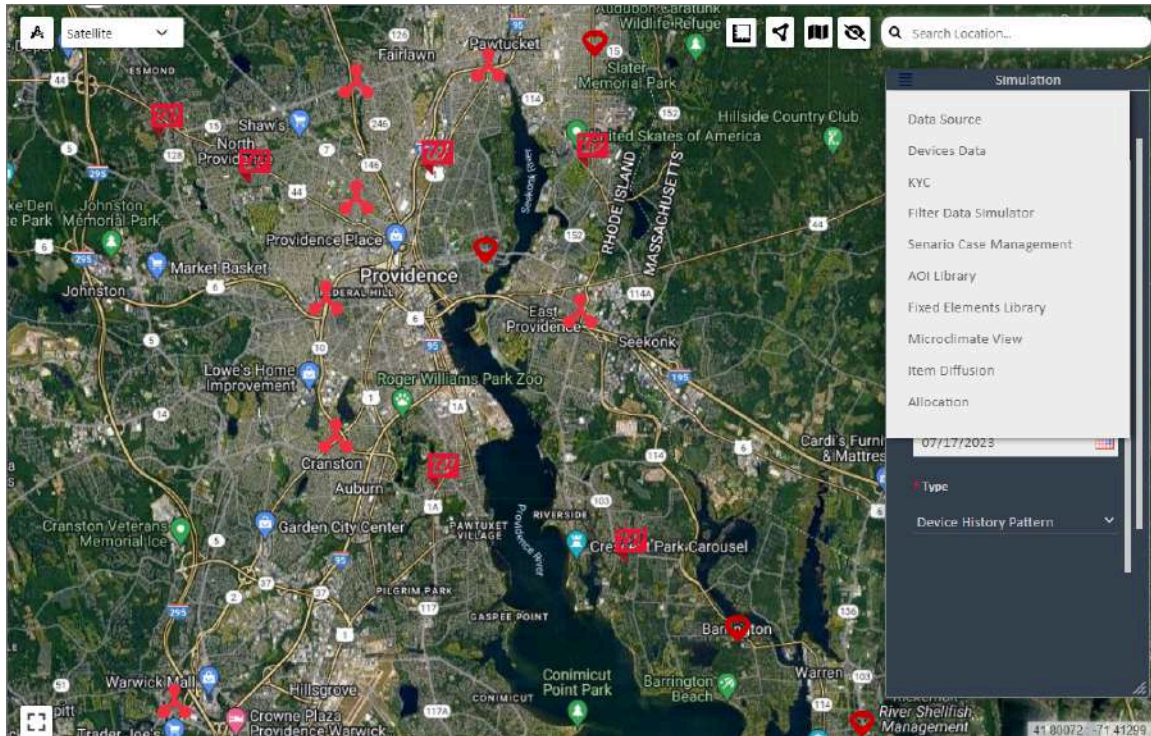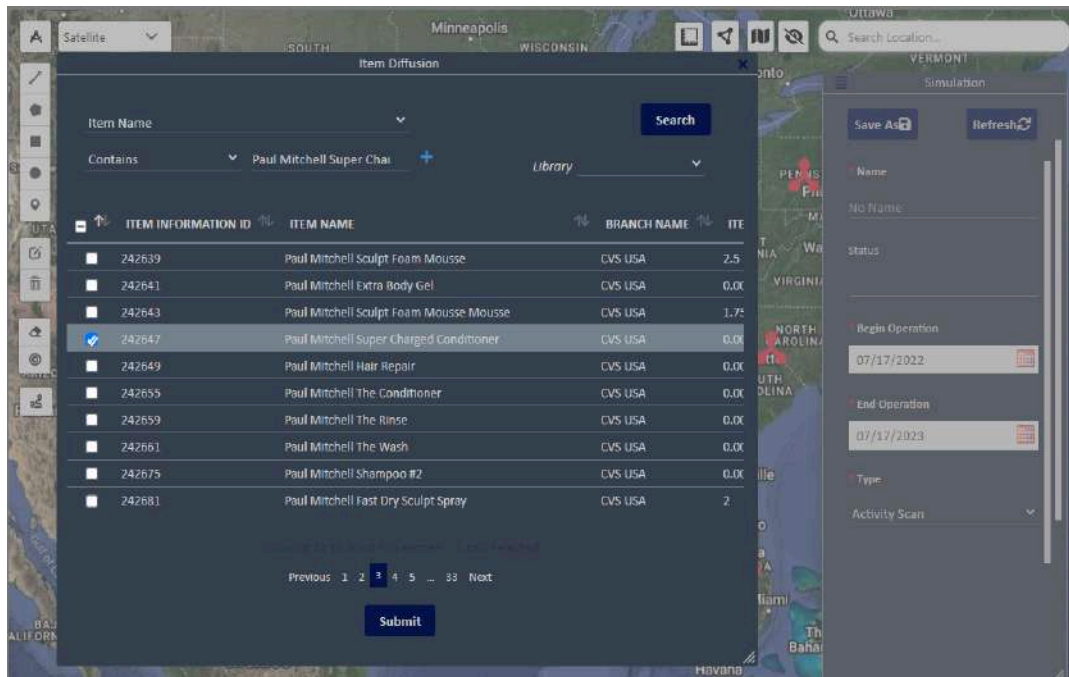

Map Explorer

1. Item Diffusion

By one click, the system can display one or more item diffusion, to check the item/stores diffusion, with the related main store information and item additional attributes. The system can generate alerts directly on item status or item diffusion status.
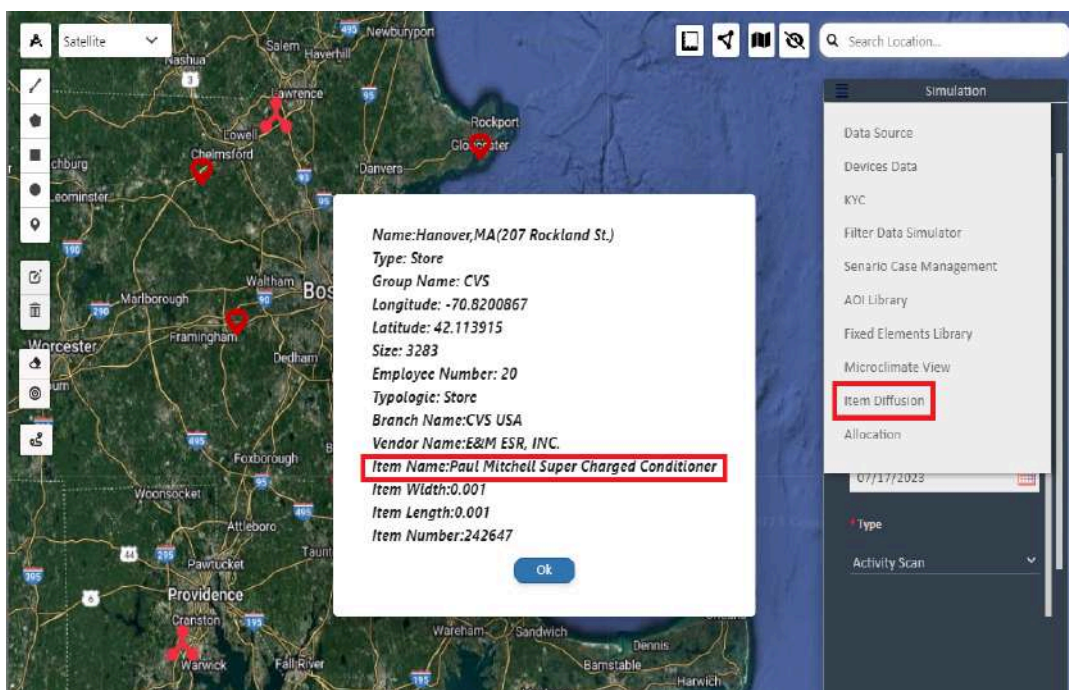
2. Allocation

The same process can be used for allocations, users can search by any type, name… and the related statuses and additional information are displayed directly for the end user, by accessing the allocation menu.
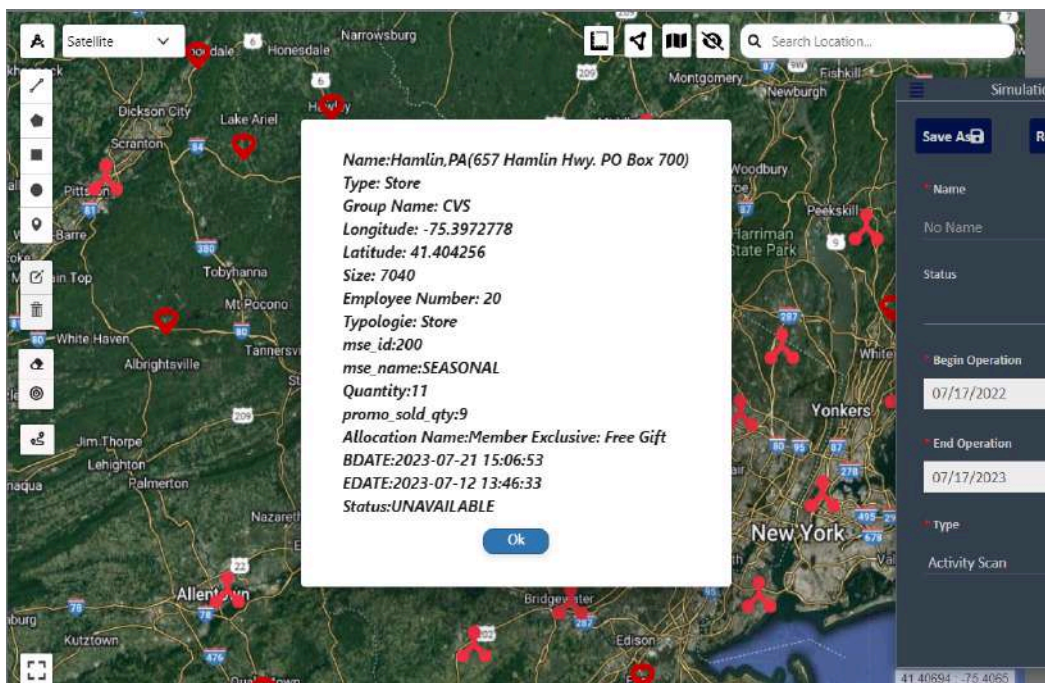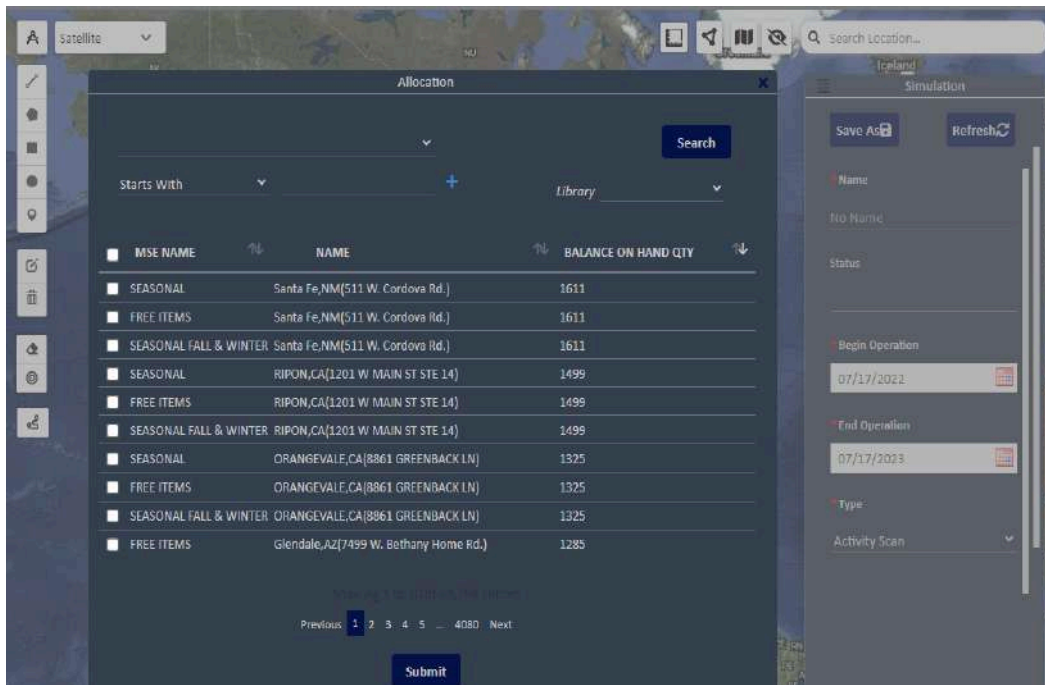
3. Microclimate view

Any CVS store with their direct competitors stores and density activity scan can be executed, saved and refreshed on a daily basis using the Microclimate view, where the system directly draws a polygon (with a dynamic parameter) around the defined CVS store and executes a fixed elements activity scan simulation.
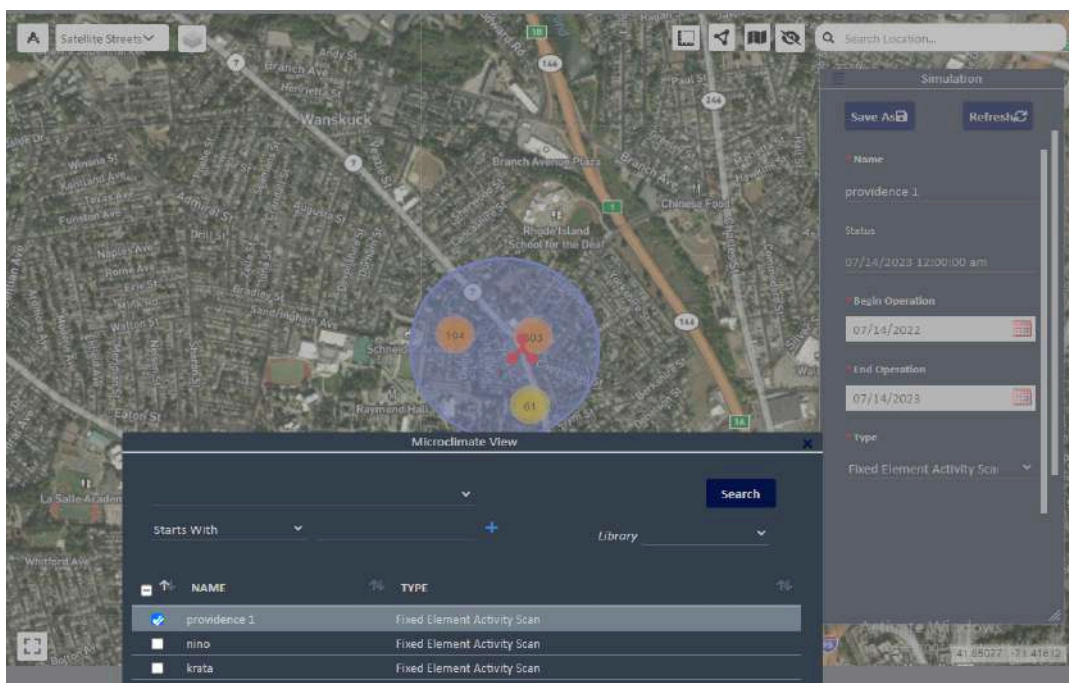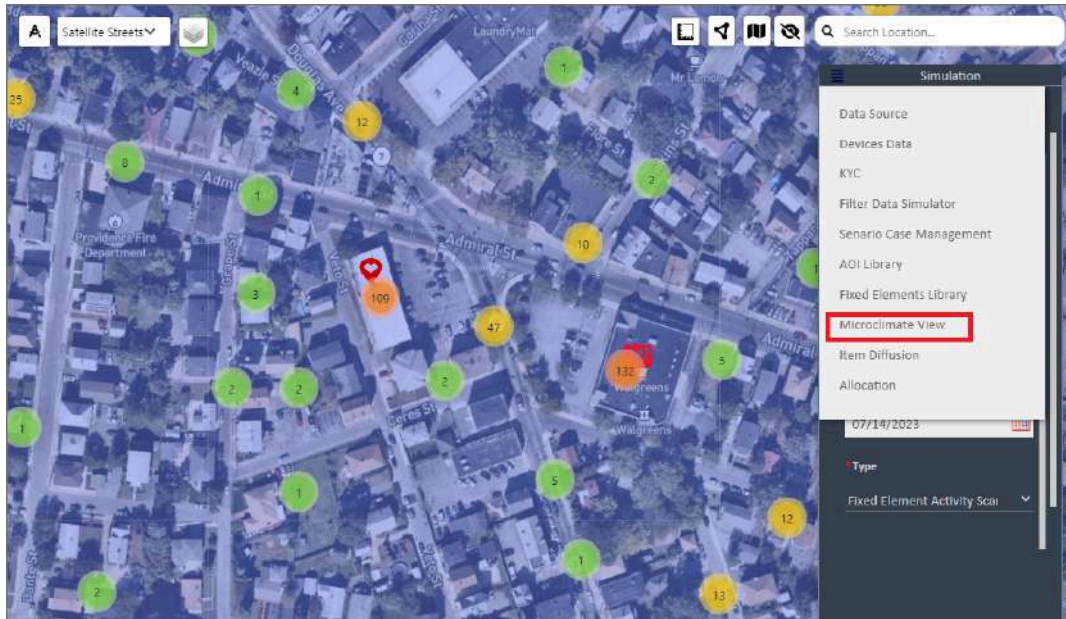
4. DrillDown Views

For a more analytical view, users can select any simulation type and execute the related query: activity scan, device history pattern, device travel pattern, fixed elements scan, fixed elements activity scan… This functionality can be executed and saved on any selected area, timeframe, stores etc.in the below example, user select 2 CVS stores and draw a dynamic polygon and execute a device history pattern in order to check the routes related to the majority of customers
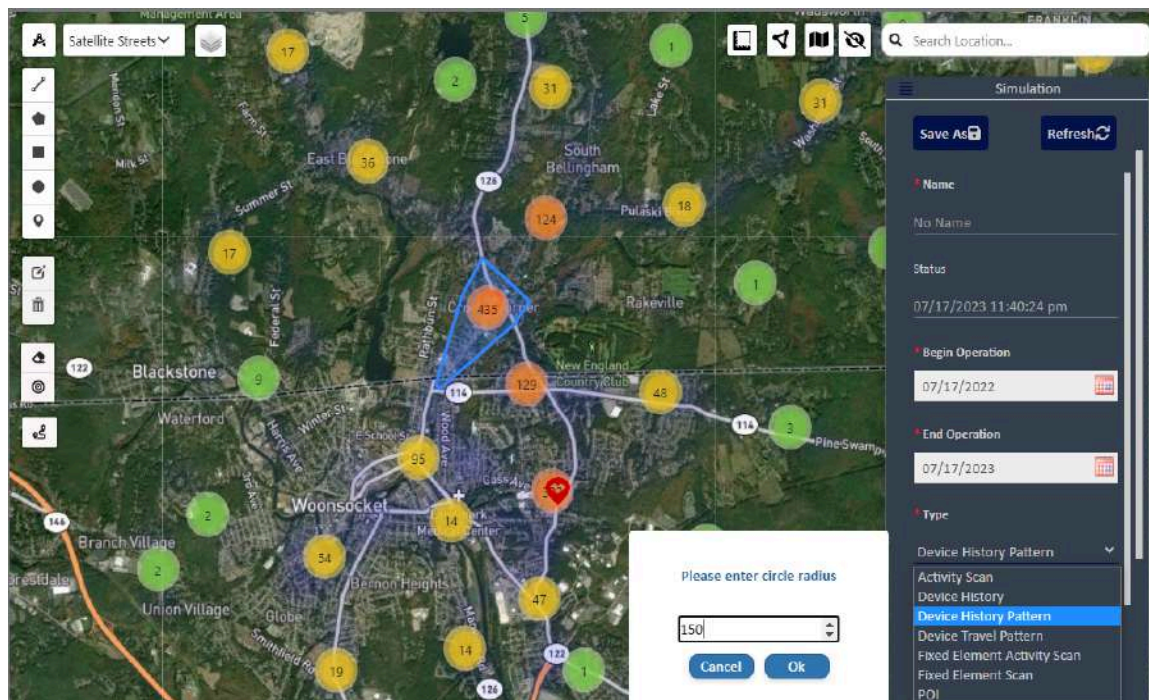
5. CVS vs competitors stores locations

By selecting any CVS store(s) from the fixed elements library, the system is able to execute a simulation using the nearby functionality and check if there is a direct competitor store nearby X

parameter area. In this scenario, the user can display the direct competitor stores and warehouses available in the region and then, execute any bulk draw and simulation type.
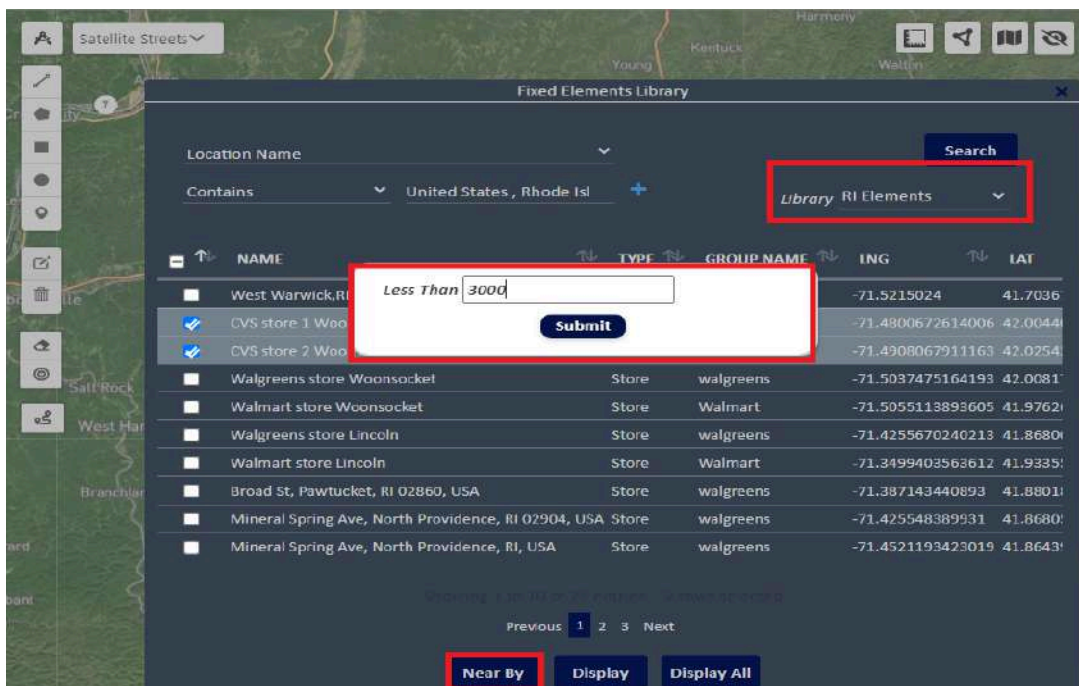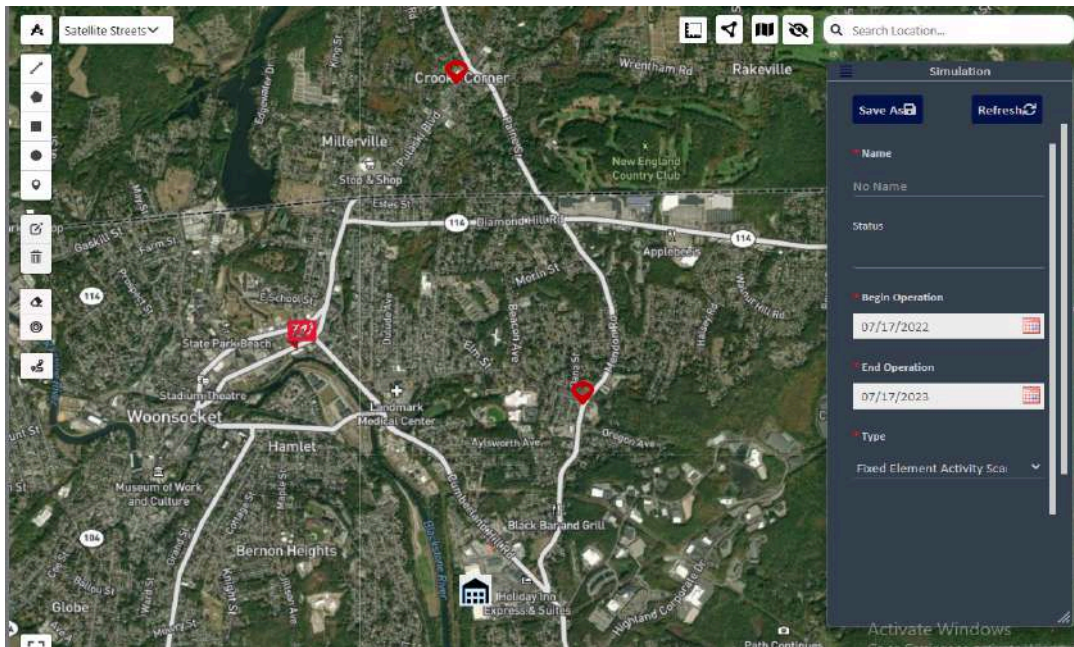
An opposite scenario can be executed, and check where the density and high population exists nearby competitor stores where no CVS store is available, this leads to search for a great new store location.
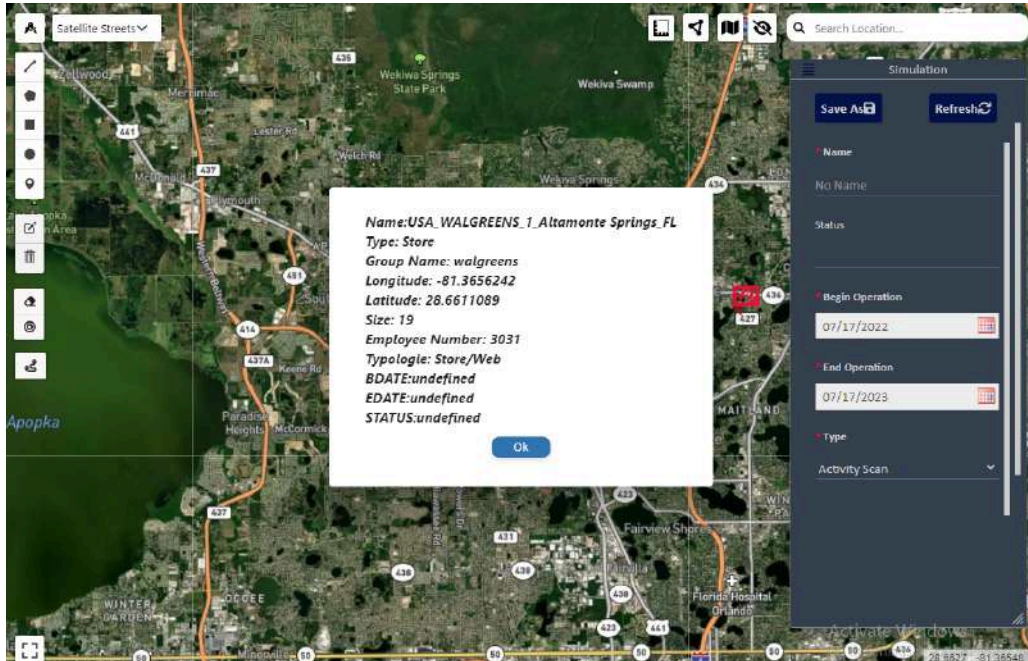
Last but not least, the system can save any library related to fixed elements, microclimate, scenario case management and refresh all libraries when needed or automatically by scheduled job.
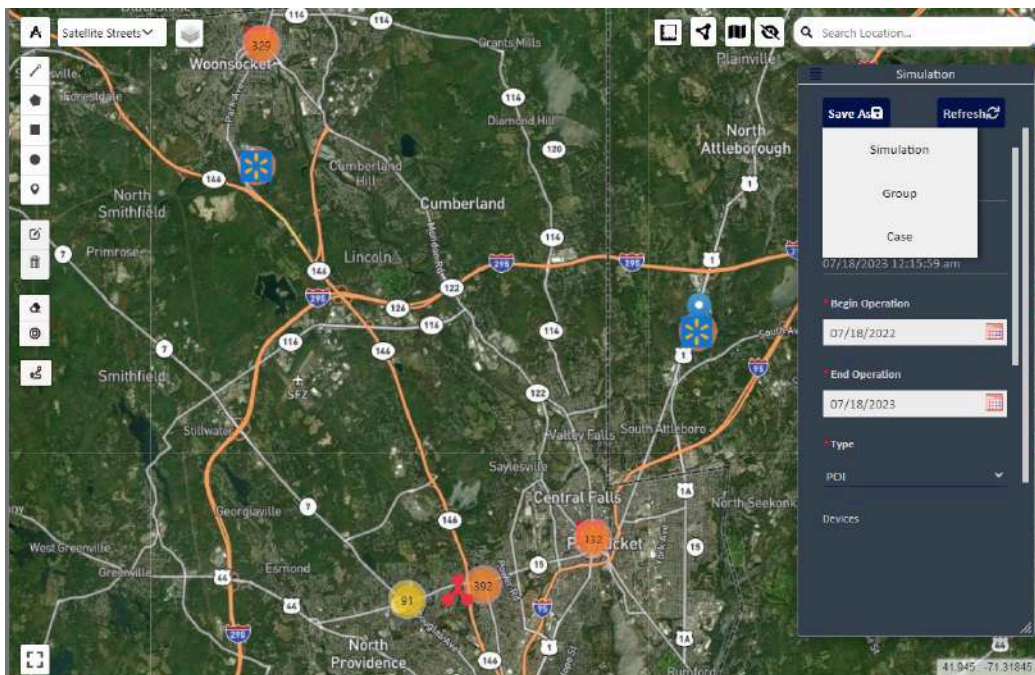
Conclusion

Retailers are classified based on their data environment and decision-making practices. Retail organizations can be categorized as data-rich or data-poor. Data-rich organizations collect large amounts of data from various sources, including detailed customer-level data. In contrast, data-poor environments lack detailed views of their customers or the markets they operate in. VALOORES Decision-making practices vary from traditional methods, such as experience and regression analysis, to more advanced techniques like predictive analytics and machine learning. While all organizations recognize the value of data and aim to incorporate data-driven analysis, not all of them are able to do so. The main barriers to leveraging data include limitations in data warehousing and challenges related to data integration, analysis, and interpretation.

Overcoming these barriers requires VALOORES Crowd Intelligence System within information and data-driven decision-making as valuable corporate assets. To achieve this, organizations need to invest in an intelligence environment accessible to different employees and departments. Securing top-down support is crucial for gaining traction and making major investments in data infrastructure.

For retail firms, adopting and integrating Big Data into the decision-making process is a significant technological challenge. However, it also presents an opportunity to redefine and enhance retail decision-making by providing a more sophisticated understanding of consumer behavior. Successfully operationalizing Big Data relies on having data environments that can handle and support the use of advanced data collection and analysis methods.

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