The State of Location Intelligence & Top Predictions for 2023

How geospatial visualization, AI, clean rooms and graph technologies will enable greater data adoption and complex use cases

FOURSQUARE

History of Location Intelligence

1

Location intelligence as we know it today first evolved from the discipline of Geographic Information Systems (GIS). Historically, this was a niche specialty, where use cases were limited to government-led initiatives like managing land records, transportation and utility networks, urban planning, census mapping, etc. Professionals in the field were typically specialists with extensive training, and the tooling was primarily desktop-based. The majority of spatial data was painstakingly collected in the field, manually compiled, and released years later.

2

The field began advancing rapidly around 2005, when Web2.0 technologies were transforming the internet. Spatial data became open to everyday consumers and, more importantly, to developers.
This newfound availability allowed people to start building on top of maps using early APIs.

3

Shortly thereafter, mobile began changing everything. The proliferation of smartphone usage meant that real-time location was accessible on any given device at all times. Not only did this enable navigation and local search, but also a whole range of different location based services (LBS). Importantly, everyday consumers began “checking-in,” providing ratings and reviews, and geo-tagging photos – this new technology decentralized the creation of spatial data with user-generated content. This brings us to current times, where spatial data is being collected and generated on a massive scale each and every day.

4

Because of these advancements in geospatial, the tools that once worked are not able to effectively handle enormous quantities of user-generated data today. Whereas many other industries have successfully transitioned to distributed data storage and processing techniques, GIS has lagged behind. There are also important issues such as data privacy that need to be addressed.

Data Maturity

Only a handful of verticals were historically data-driven.

Whether expanding into new regions, optimizing supply and delivery chains, or segmenting and serving customers by geography, many different types of businesses are routinely making location-based decisions. To support these actions, companies often turn to data analysts and data scientists who can work with large-scale geospatial datasets. These experts are rare, and commonly lack the tools they need to extract patterns and relationships from geospatial datasets at scale. As a result, most enterprises today under-utilize geospatial data – in fact, Forrester research reports only 26% of data strategy leaders say that their organization is utilizing location intelligence to its full potential.

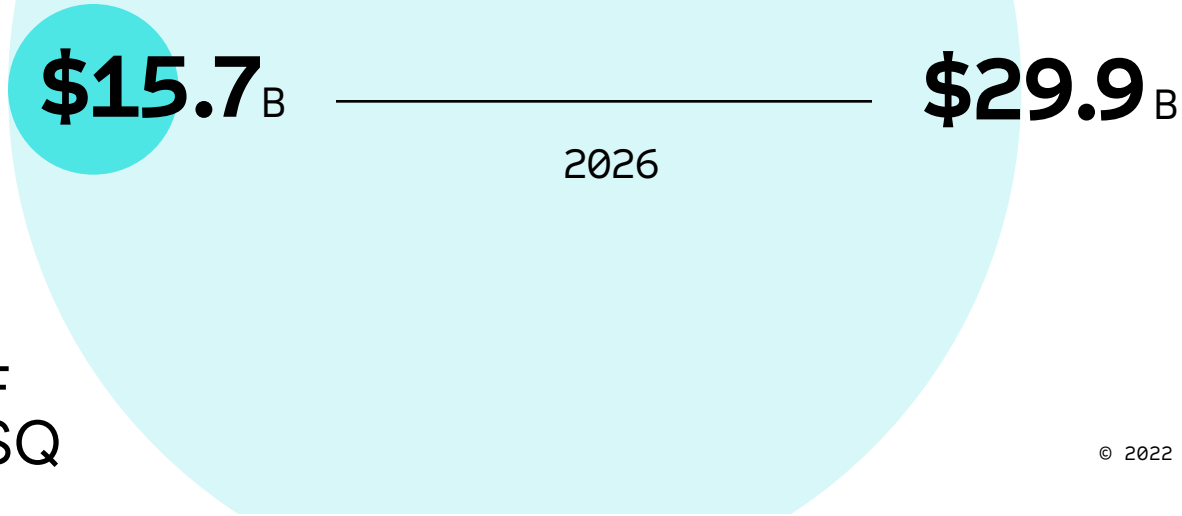
FSQ

Now many more industries are becoming data-driven, and it's growing fast.

More and more businesses are starting to recognize the importance of data, and location data in particular. In 2022, 73% of data strategy leaders agreed that harnessing location intelligence across an organization is critical to driving business results, according to Forrester research. There's pressure to continue investing in order to keep up with the pace of change in the market. When asked about the biggest problems they currently face, buyers of geolocation technology cited, "staying ahead of the market by continuing to innovate and scale," as a top concern.

73% OF DATA STRATEGY LEADERS AGREED THAT HARNESSING LOCATION INTELLIGENCE ACROSS AN ORGANIZATION IS CRITICAL TO DRIVING BUSINESS RESULTS

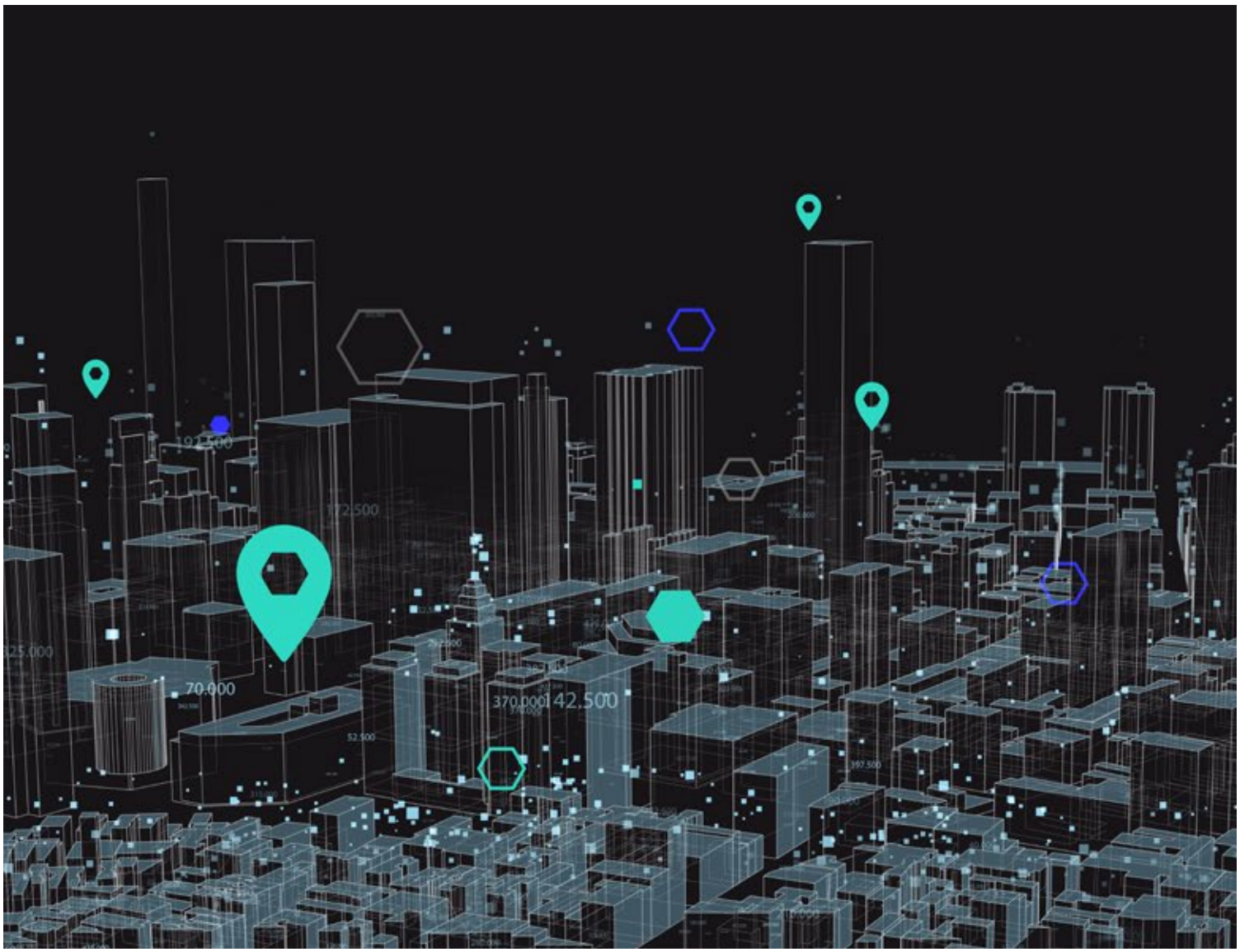
Perhaps for this reason, the location analytics market is projected to grow from $15.7B in 2021 to $29.9B by 2026, at a Compound Annual Growth Rate (CAGR) of 13.8% during the forecast period, according to Markets and Markets. As an industry, location analytics is driven by an uptick in spatial data and analytical tool usage more broadly. Forecast to 2027, this market is expected to grow to $119.9B by 2027. Suffice it to say, growth is on the horizon.



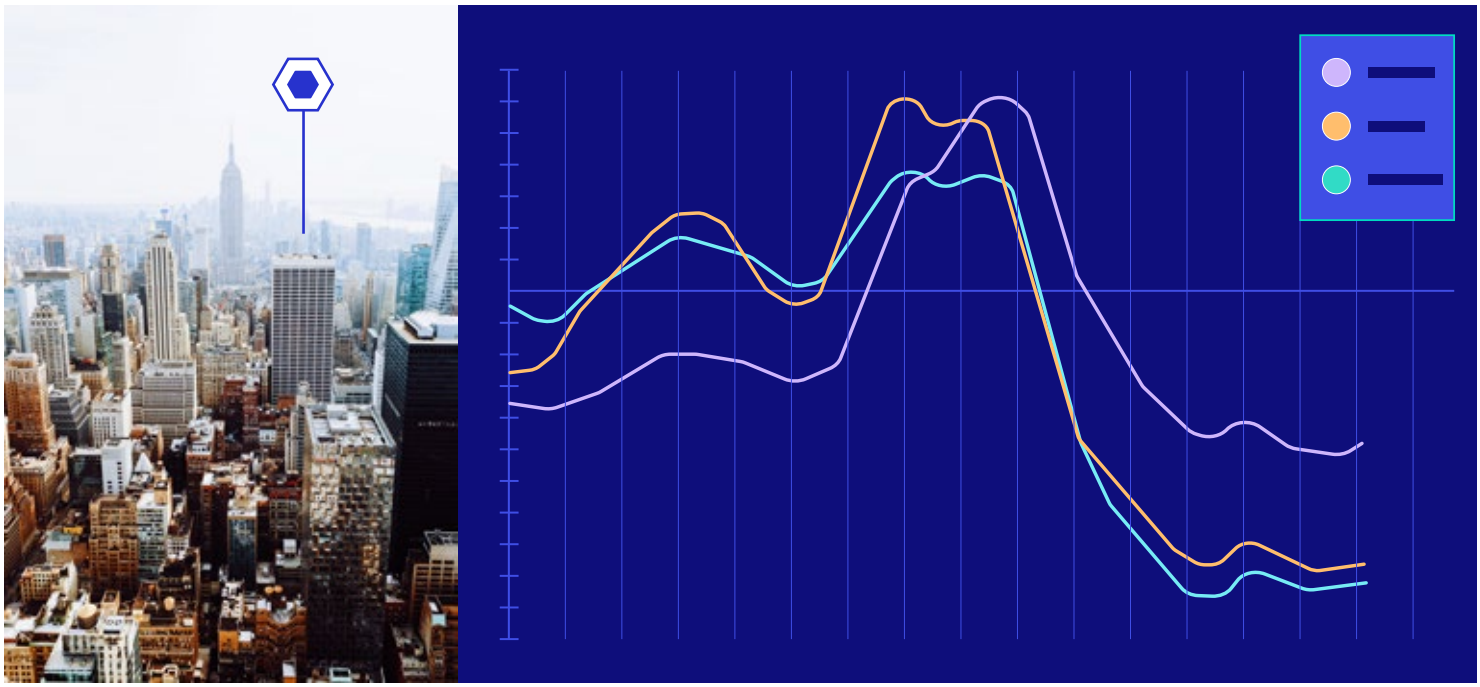
FSQ

New and emerging use cases

Amidst this rapid growth, more complex and advanced use cases for geolocation technology are emerging. Buyers of geolocation technology report that top use cases include predictive analytics and data science — using the data to perform various analytics and build Machine Learning and AI models to give better predictions, maximizing the utility of the data.



FSQ



Advanced analytics can be used to help businesses better understand their customers. According to Forrester research, 75% of data strategy leaders say location technology will be equally or increasingly important for customer analysis and segmentation in the next two years. In fact, 78% of data strategy leaders agree that location intelligence is critical to understanding how customers engage with their company. Buyers of location intelligence report that they seek location technology to understand where their target client base resides and activities they engage with in order to conduct market segmentation analysis.

This nuanced understanding of consumer behavior is critical because it ultimately leads to smarter business decisions. Forrester research notes, 57% of data strategy leaders would expect that investing in better location intelligence solutions will result in improved decision making.

One key decision every expanding brick and mortar business faces is, “where should I open my next location?” 74% of data strategy leaders say that location will be as or more important for physical site selection in the next two years. But analysts tasked with solving site selection or service coverage problems need a network of data points connecting places, people, and their movements over time. A data analyst often works alongside a data scientist to:

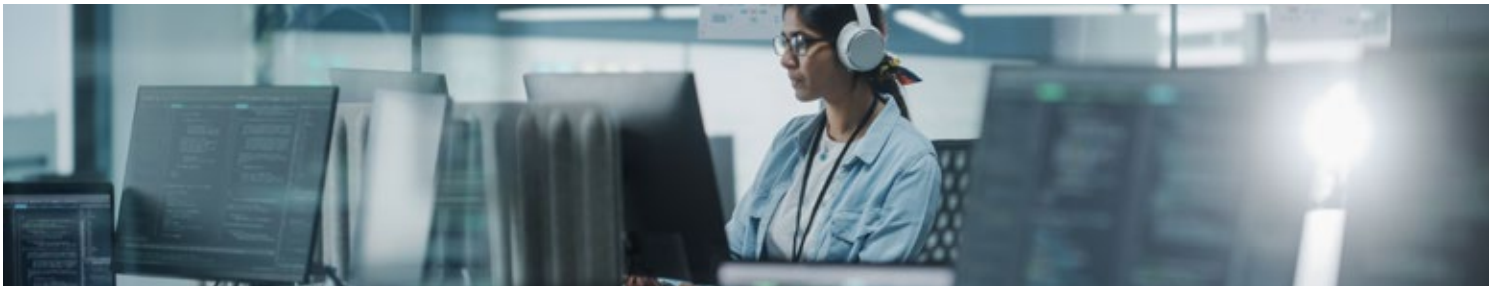
- Evaluate the quality of data sources and compensate for gaps
- Join geospatial data with other data sets
- Wrangle the data into a format suitable for analysis
- Explore the data visually
- Build a hypothesis
- Combine attributes with predictive potential into metrics or “model features'
- Run analytic queries or train models using machine learning algorithms,
- Deliver these insights and predictions in the form of reports and dashboards

F
SQ

Today, these tasks require specialized skills in geospatial-temporal analysis that even expert data scientists lack. They need interfaces to data, analytics, and presentation capabilities that even mature geographic information systems fail to scale. Additionally, specialty collaboration tools that even cloud-scale platforms don't provide are essential for spatial data scientists, data analysts, and application developers to complete these tasks.

Moving forward, many more organizations will take advantage of location intelligence to make better decisions – like segmenting the population of prospective customers or selecting a new site – and will continue looking for simpler ways to make location-based decisions.

Current Challenges With Location Intelligence



Gathering, integrating, and visualizing data is often seen as a financially exorbitant and time-intensive feat. In order to address complex use cases, a data analyst must source and process a large, diverse volume of data about places, people, and their movements over time. A series of error-prone operations must first be performed to join geospatial data with demographic data. Then, the analyst can evaluate the quality of data sets and compensate for gaps, wrangle the data into a format suitable for analysis, explore the data visually, build a hypothesis, and execute analytic queries or train a model to fit the data.

Performing these operations requires rare skills, plus added patience to find and fix errors iteratively over many weeks. Moreover, many new data science capabilities have become available over the past decade, most data scientists and analysts lack tools that can operate on geospatial datasets at scale.

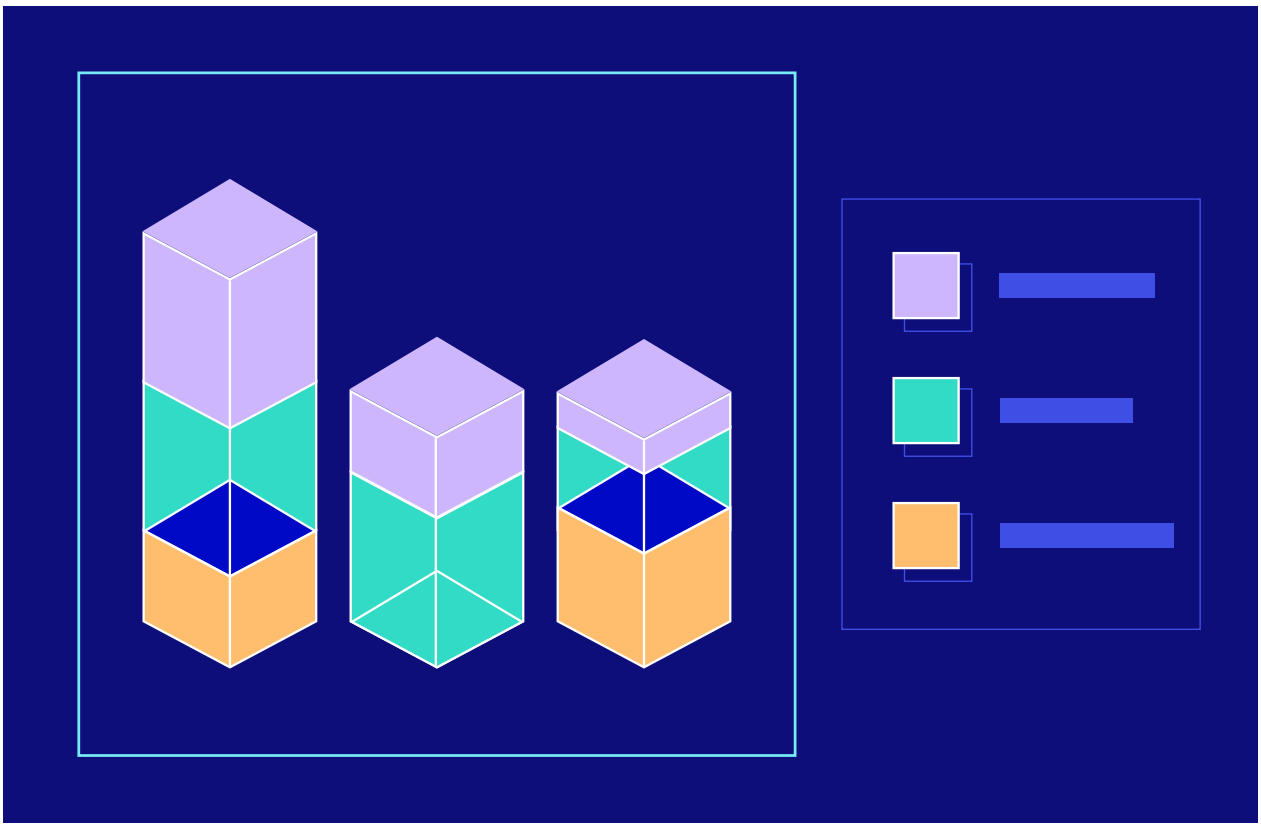
Today, businesses often acquire location data from multiple providers. Before they can see any value from it, they must first prepare the data for analysis, then analyze the data by extracting patterns and implicit relationships, and then finally integrating the analytic results into their web services or mobile applications. Each of these tasks requires specialized roles, skills, and time-consuming effort. Enterprises that leave data scientists, data analysts, and developers to work with traditional GIS applications or open source tools run the risk of delays or failures. Traditional GIS tools are no match for the challenges of enriching large data sets with geospatial context, visualizing geo-tagged data at scale, and folding geospatial data into the seams of modern analytics and AI.

F
SQ

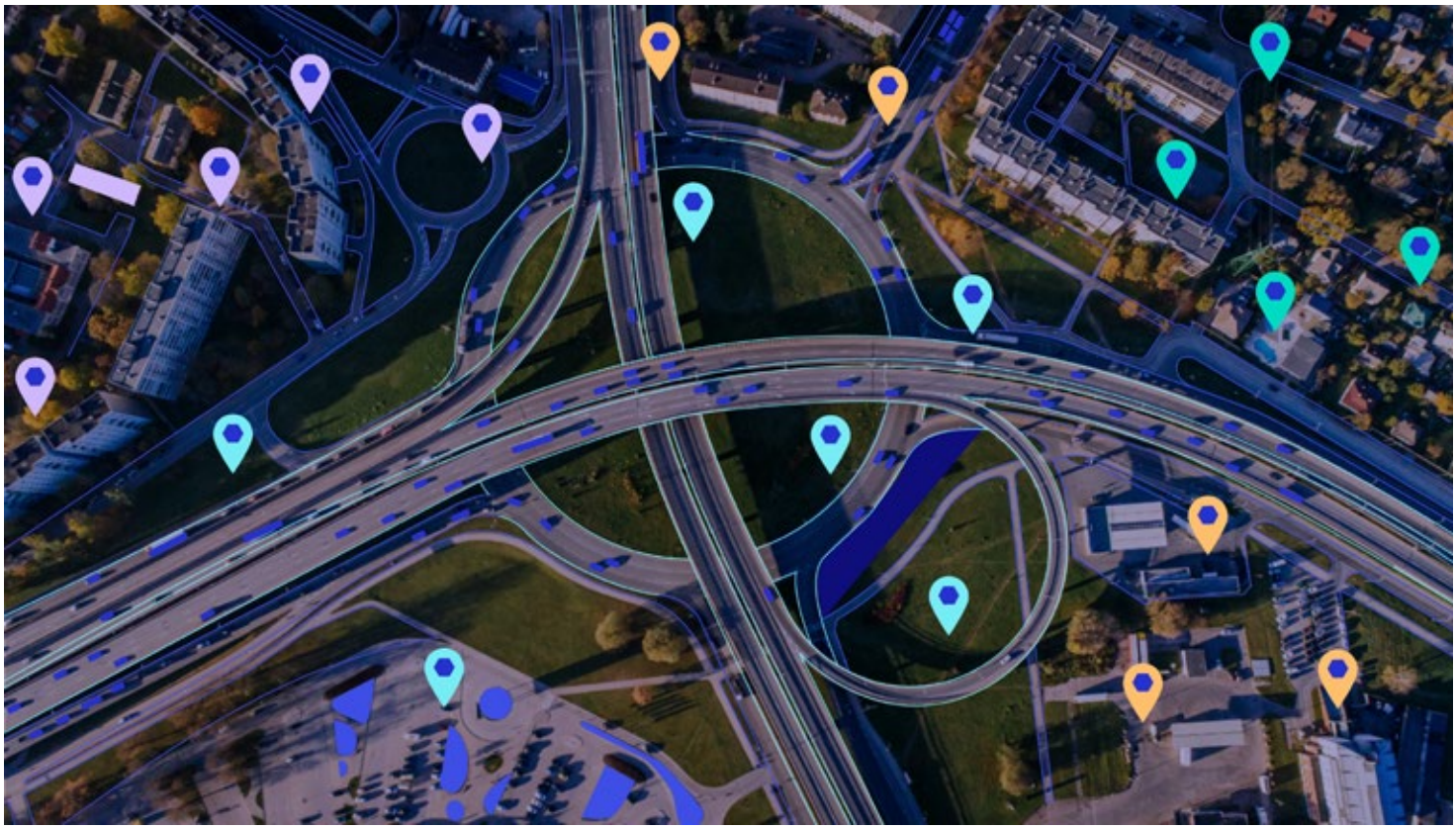
Forrester research confirms these pain points. For instance, 55% of data strategy leaders report that “cleaning and transforming data takes too much time” – inhibiting the full potential and efficacy of location intelligence. Moreover, 50% of data strategy leaders also say that “we can’t merge location data with other data effectively.” When asked about the biggest problems their business faces, buyers of geolocation technology reported struggling with “the lack of data from one central source and integration with various platforms.”

For this reason, 41% of data strategy leaders say that “the capability to combine different types of data from multiple sources” is a top quality in an ideal location intelligence platform, according to Forrester research.

As a result of these challenges, and despite the fact that over 80% of all data has location attributes, most enterprises today under-utilize geospatial data while making mission-critical decisions.



Where the location technology industry is going in 2023 and beyond



F
SQ

Building solutions for the entire enterprise

With more companies leveraging advanced technology and data analytics in their workflows and strategies, it's becoming imperative that these solutions be understood and accessible to everyone – not just like-minded engineers with a strong coding background. In 2023, expect to see a shift in location solutions that are data driven – companies will be investing in low-code/no-code platforms and tools that will be used by the entire enterprise.

Here at Foursquare, we've designed our APIs and visualization tools so that they're readily accessible to less technical users. Our solutions seamlessly answer questions about increasingly complex geospatial data,making the analytical process as easy and impactful as possible.

Going visual with data

Data powered businesses throughout the pandemic and will continue strong into 2023. Companies will take data one step further, focusing efforts to create more robust data visualization solutions or optimizing current tools with these capabilities.

Visualization will evolve from the ability to represent data into an ability to analyze data. Visual analytics will drive data science workbenches like Amazon SageMaker, making it possible to explore billions of rows of data as easily as directions on a map, identify clusters of data as easily as points-of-interest, and build hypotheses as quickly as creating maps. Teams will use new collaboration capabilities to create and share visualizations to solve problems effectively.

Foursquare Studio is a highly flexible platform designed to visualize and analyze large-scale geospatial data at the speed of business. Within Studio, users can visualize complex movement patterns over time with the support of Hex Tiles, a proprietary next-generation tiling system that not only unifies diverse spatial datasets and conducts analytics, but also visualizes and explores big data on a planetary scale.

Advanced visual capabilities make better sense of data and help teams discover patterns or trends that often go unnoticed.

.

AI is advancing, but needs more data to do so

COVID-19 might have ignited the digital transformation, but momentum for artificial intelligence and machine learning have kept going well past the peak of the pandemic. As expected, there is high demand for engineers and a call for more tech-savvy talent in senior management roles. However, as organizations navigate financial turbulence and cost-cutting measures in 2023, they will need to rely on technology to fill in bandwidth and output gaps.

That's where AI comes in. Engineers are developing algorithms to address business pain points and make workflows more efficient, but need more data to do so. An AI model is only as good as its data, which makes data management and analytics platforms like Foursquare even more critical. Data sourcing and preparation takes time and energy, but can lead to major payoff if a company can successfully leverage AI. In turn, the AI model will be that much more impactful.

From regulation-compliant to privacy-forward

The privacy landscape is shifting rapidly by mandating consent-driven data collection practices and restricting data sharing among third parties. As a result, the coming years will bring a focus on establishing first party connections to consumers, and preventing any leakage of that data into the wider ecosystem.

Businesses will increasingly turn to privacy-preserving methods such as differential privacy, homomorphic encryption, and clean rooms. Using differential privacy (injecting noise into a data set and enforcing a privacy budget on queries), enterprises will protect the privacy of individuals while detecting patterns in aggregate. Using homomorphic encryption, which preserves the consistency of mathematical operations over encrypted data, enterprises will build useful applications with encrypted data at rest, in transit, and in memory.

Clean room technology is emerging as another promising approach that enables businesses to query conjoined data sets without revealing their data to others. This can support a variety of different use cases, such as advertising measurement and CRM enrichment, while still protecting consumers' privacy. For example, in 2022, we saw Roku launch a new clean room for advertising measurement, with Foursquare as a key data partner. Expect privacy-safe clean rooms to become more and more prominent in 2023 and beyond.

.

Get ready for graph

Graph databases – or platforms with relationships between prebuilt datasets to drive discovery of next-level insights and patterns – have held enormous potential for over a decade.

But until recently, using graph databases required intentional organizational scalability, and even one uncorrelated datapoint threatened to corrupt an entire effort. Graph-focused platforms are on the rise, so much so that experts at Gartner predict that by 2025, graph technologies will be used in 80% of data and analytics innovations.

With this forecasted growth, graph processes will bolster strategic planning across industries and will likely be the default for data scientists in any field looking to gain valuable insights. Not only do graph databases make data easier to understand, they also offer digestible findings to share with stakeholders and other functions within an organization. This use case has become extremely important in supporting today's remote and hybrid workforce.

Incorporating high quality location data into graph databases will unlock invaluable new insights, while also maximizing consumer privacy.

The takeaway

Ultimately, buyers of geolocation technology will need to identify a partner who can provide the utmost accuracy, while also offering the privacy, flexibility and scale needed to address complex business needs.

Learn how Foursquare fits the bill at location.foursquare.com.

FSQ

Key questions to ask your geolocation technology provider:

- How will you enable me to integrate location data with other datasets?
- What solutions do you provide to empower less technical stakeholders?
- What are the implications of privacy changes on your products?
- What are you doing to future-proof your business?
- How are you ensuring that your business will not only survive, but thrive in 2+ years?

FSQ

Works Cited

"Location Intelligence Builds Innovation and Better Customer Experiences"
Forrester Consulting | July 2022

"Location Analytics Market"
Markets and Markets | December 2022

"Geospatial Analytics Market"
Markets and Markets | September 2022

"The Value of Data Visualization"
DAU | July 2018

"Not To Be Left Out, Roku Announces Its Clean Room Service In Time For The Upfronts"
Ad Exchanger | April 2022

"What is Graph Technology? What can it do?"
Security Boulevard | September 2022

"Market Guide for Graph Database Management Systems"
Cambridge Semantics | August 2022

"How Graph Analytics Can Transform Enterprise Data Protection"
Spiceworks | June 2022

FSQ