

REDEFINING CITY TRANSPORTATION WITH SMART SCOOTERS USING SNOWFLAKE

CONSUMER SERVICES

voi.

COMPANY Voi Technology

LOCATION Stockholm, Sweden

SNOWFLAKE WORKLOADS USED



Voi Technology is a Swedish company offering electric scooter sharing in partnership with cities and local communities. It believes e-scooters and e-bikes can play a central role in changing how people move in cities in the future. Voi has been carbon-neutral since January 2020, has adopted the United Nations' Sustainable Development Goals (SDGs), and has a clear agenda for reducing and offsetting emissions.

STORY HIGHLIGHTS:

Stronger relationships with cities served

Snowflake's ability to centralize all geospatial data in one central repository lets Voi derive more insight internally and share it easily with cities to drive its mission of improving urban transportation planning and outcomes.

Analytics at scale

Analysts are now unblocked and can run self-service analytics with consistently high performance, empowering greater innovation.

Protect sensitive data

Voi significantly improved its data governance capabilities using Snowflake's Dynamic Data Masking to protect personally identifiable information.

“We have an ambitious goal of transforming all city transportation to be carbon neutral, and that means relying on data from Snowflake to examine all parts of our business to maximize operational efficiency and sustainably grow our partnership with the cities we serve. Since January 2020 Voi is carbon neutral.”

—JONAS RUNDBERG, VP of Software & Data, Voi

CHALLENGE:

Achieving higher performance without manual management for self-service analytics at scale

With IoT data generated by its fleet of scooters, Voi manages data at a massive scale. According to Voi's Business Intelligence Developer, Fernando Brito, “Since day one, data has been essential to our business and operations. We need to have optimal placement of our scooters to meet user needs, and there are hundreds of factors to consider.” Voi had most of its back-end services already in Google Cloud and was using Google BigQuery for data analytics and queries. However, as the company and data rapidly grew, BigQuery became a bottleneck. To avoid contention and performance issues, all requests had to pass through the central data engineering team, which delayed access to analysts and business units.

Voi contended with fluctuating performance due to the lack of visibility to real-time resource consumption. With BigQuery, users could inadvertently generate a query that consumed a significant portion of their available slots, negatively impacted other queries. “We often exceeded our allotted slots of compute because queries were too large, which throttled performance. Query timeouts happened when daily reports ran in the morning and prevented reports from being completed successfully,” said Brito. Voi tried to space its reports throughout the day, but that was operationally challenging and didn't solve the problem. All of it required too much administrative effort and limited efforts to get to a self-service analytics model.

SOLUTION:

Supporting business units while freeing up the data engineering team

With the Snowflake Data Cloud, Voi has a centralized platform that can support every business unit's unique consumption of data. Instead of handling data requests, the central data engineering team now focuses on data governance and defining guidelines to ensure the data quality. “Snowflake's Data Cloud is the future-

proof data platform that will evolve with us. We can choose to work across multiple public clouds when ready, and analysts are now unblocked and can run self-service analytics with consistent high performance, empowering greater innovation,” said Brito.

Seamlessly protecting personally identifiable information

Using Snowflake’s native governance capabilities, the company was able to implement a role-based model to govern each department’s data access, and have the policies consistently applied across workloads, something it did not do with BigQuery. Paired with Dynamic Data Masking, Voi’s team can now ensure sensitive data is protected without having to maintain multiple masked base tables. Masking is applied at query time, so users only have visibility to the data they have access to based on role.

RESULTS:

Successful relationships with cities using geospatial data

Geospatial data generated from IoT devices is core to Voi’s success. Every scooter reports its location, battery level, and related status indicators every few seconds. Voi also manages geospatial data in each city, denoting where scooters can park and where speed limits apply.

“All of this data is ingested into Snowflake and enables us to better understand whether our operations and network of scooters are functioning properly,” said Brito. For example, data in Snowflake helps the company understand when to optimally change the number of scooters in a designated area.

“We codesign with cities and share the immense amount of data gathered to help them make decisions about their own public transport systems. Sustainable, environmentally friendly transportation is the backbone of Voi’s mission. It’s not enough to just be in compliance; we want to grow and build trust with the city and customers we serve. And Snowflake helps us do that.”

—JONAS RUNDBERG, VP of Software & Data, Voi

Effective maintenance of scooters using data

As part of Voi’s commitment to high standards, it uses its own operations network and also third parties to maintain, pick up, and drop off scooters. “For all this to work, we want our logistic partners to meet our operational expectations and KPIs. Tableau dashboards powered by Snowflake create visibility into performance, so our partners can determine if they’re meeting expectations or if they need to hire more employees,” said Brito.

In Snowflake, Voi stores detailed data about each scooter, including its components’ status and a history of repairs. For all scooters, reports track how many parts have been used in repairs, which helps the company understand how many parts to buy, along with when and where they’re needed, which has increased the lifespan of scooters from months to 5+ years.

“Innumerable factors contribute to transportation patterns.

Snowflake is opening doors for business units to ask bigger-picture questions. Every city is different and we want to be hyperlocal; we’re able to test new markets and analyze how weather impacts scooter usage and maintenance,” said Voi’s VP of Software & Data, Jonas Rundberg.

Demand forecasting and route optimization using machine learning

Voi is working to implement machine learning for demand forecasting (where scooters should be placed and when) and route optimization (the best route drivers can use to place scooters). This machine learning uses data in Snowflake, including historic user-demand information, to predict usage patterns over the next few days.

“Snowflake Secure Data Sharing is key to enabling our external partnerships for machine learning. Their access to raw data is under our governance, and that enables us to confidently continue working with them.”

—FERNANDO BRITO, Business Intelligence Developer, Voi

FUTURE:

Increasing data science capabilities and exploring external data sets

Going forward, Voi plans to grow its data science abilities in-house through Snowflake and enrich it with data sets available in Snowflake Data Marketplace (for example, data on weather and street maps). By connecting to Snowflake Data Marketplace, the company will be able to generate queries that securely access external data sources and join that data with its own data in Snowflake for better models and results. “Transportation has countless factors to consider, and as we become more sophisticated with data science, it will be our choice to add more and more dimensions to what we analyze. With Snowflake’s Data Cloud as our base, it’s an exciting future roadmap we have in front of us,” said Jonas Rundberg.

ABOUT SNOWFLAKE

Snowflake delivers the Data Cloud—a global network where thousands of organizations mobilize data with near-unlimited scale, concurrency, and performance. Inside the Data Cloud, organizations unite their siloed data, easily discover and securely share governed data, and execute diverse analytic workloads. Wherever data or users live, Snowflake delivers a single and seamless experience across multiple public clouds. Join Snowflake customers, partners, and data providers already taking their businesses to new frontiers in the Data Cloud. snowflake.com