

WHITEPAPER

HOW TELECOMS CAN MAXIMIZE THEIR COMPETITIVE EDGE USING 5G DATA

EXECUTIVE SUMMARY

Data is one of the most critical components of a telecom's competitive arsenal, and the arrival of 5G will take data to the next level of importance. Data is gathered, accessed, and analyzed for use in every aspect of the organization, from network quality management to marketing, and customer success to finance and operations. Yet while there is no doubt about the importance of data, many telecoms still have their data stored and maintained in legacy data warehouses and cumbersome Hadoop data lakes.

In fact, industry estimates show that only a small fraction of data in the organization is accessed and analyzed while still fresh and relevant, if at all. Telecoms leave behind critical, game-changing business insights due to long-running queries or their lack of resources to execute extremely complex queries. This challenge is magnified as data grows exponentially, and time series analytics grow in scale and scope. Compounding these data challenges, 5G is expected to increase data volumes to levels never seen before.

Opportunities abound for telecoms who can manage and rapidly analyze these massive stores of data. In addition to being able to maintain customer satisfaction and recruit new customers on the basis of solid positioning of quality and excellent customer experience, telecoms will be able to bring to market and to their existing customers new and highly targeted products and services.



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These offerings will be based around everything from IoT and mobile data management, automotive connectivity and enhanced fleet operations, entertainment and games, and energy and utilities.

The common denominator of how telecoms handle internal data challenges, leverage insights obtained, and intelligently add new products and services to their arsenal is the ability to manage and rapidly analyze the massive data that comes with 5G.

SQream provides massive data analytics acceleration, which enables telecoms to rapidly access and analyze up to a hundred times more of their massive data while significantly reducing the execution time of long-running queries, so they can maximize their competitive edge and bring 5G opportunities to fruition. With unprecedented speed and flexibility, operators can uncover previously inaccessible insights about their infrastructure and customers, enabling superior customer experience with high-quality and reliable levels of service.

INTRODUCTION

The extremely high competition in the telecommunications market, together with intensifying 5G competition, means that operators must increase their focus on delivering superior customer experiences in order to gain competitive differentiation, retain existing business, and win new customers.

In a recent interview, Orange CTIO Michael Trabbia noted that between 60 to 80 percent of Oranges' data traffic will be running over its 5G networks within the next six years, as he discussed some of the business cases for the next-generation technology. This is no surprise with Gartner forecasting that worldwide investment in 5G network infrastructure will grow by 89% in 2020 to \$4.2 billion, and to \$6.8 billion in 2021. International Data Corporation (IDC) projects the number of 5G connections to grow from roughly 10 million in 2019 to 1.01 billion in 2023. They predict that the amount of digital data generated from what IDC calls the Datasphere will grow from 33 ZB in 2018 to 175 ZB by 2025.

In line with these forecasts, Orange's Trabbia also highlighted the significant growth of data traffic which is already growing at a rate of 40 percent a year in the consumer and enterprise markets due to the additional capacity the technology brings, which he said would unlock key opportunities in a variety of sectors. The technology he noted would deliver "a revolution" in the enterprise sector. But to keep up with this growth and harvest these opportunities, operators must continuously invest in their network, data management, and analytics capabilities.

On average, 5G can reduce latencies of about 80-100 milliseconds to less than 10 milliseconds. Since 5G will connect hundreds of millions more devices and sensors, operators must prepare by reviewing their present network infrastructures and data management software to determine how to manage exponentially more devices and network traffic, and the data created by both consumers and enterprises that will need to be managed and analyzed.

One of the biggest challenges for 5G will be how companies will manage and analyze the extremely fast-growing data stores. 5G network characteristics such as high-bandwidth, low-latency, and mobile edge computing, as well as 5G's ability to support fast connectivity across diverse devices (sensors/gateways/controllers) will drive this data growth.



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In order to take advantage and leverage these growing data stores to support business applications and use cases over 5G networks, companies will require a data analytics acceleration platform to analyze the massive and growing data stores, with the ability to provide intelligence while the data is still relevant and actionable.

5G ADVANTAGES CREATE DATA MANAGEMENT CHALLENGES

The most widely discussed benefit of 5G is its connection speed, which is significantly faster than what the 4G network could provide. 5G has the potential to reach 10 gigabits per second, an increase that could provide game-changing opportunities to enterprises across all industries. The amount of data that enterprises transfer will grow even more rapidly than under 4G. This huge increase in data creation and transfer will bring with it significant challenges of network management, quality of service and security, not to mention data management and ongoing ability to analyze the data.

5G also supports significantly higher device capacity. It is estimated that 5G can support one million connected devices per 0.38 square miles, where 4G could support just 2,000. This huge increase means that with 5G, enterprise networks are able to host much larger numbers of devices in their IT infrastructure. This will be another huge data generator, as simultaneous data transfer is enabled due to the network's larger spectrum band.



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In addition, the latency challenges of 4G networks will all but disappear in 5G. The reduced latency will encourage a new generation of applications, both consumer and enterprise, and will encourage businesses to implement IoT applications and solutions into their enterprise systems. This will be yet another driver in the explosive growth of data stores from 5G. In order to take advantage and leverage these growing data stores to support business applications and use cases over 5G networks, companies will require a data analytics acceleration platform to analyze the massive and growing data stores, with the ability to provide intelligence while the data is still relevant and actionable.

5G REQUIRES A CHANGE IN HOW DATA IS MANAGED

5G represents a change in the way mobile networks are managed and operated. Operators will have more control, enabling them to act dynamically, and to handle both challenges and opportunities that arise. Some of these new opportunities, such as network slicing, or the ability to slice network data for different use cases or quality of service (QoS) requirements, will require advanced data analytics. If the data isn't readily accessible or simply takes too long to analyze to be relevant due to extremely long-running queries, these opportunities will be lost.

Adding to the complexity, 5G will see a surge in Internet of Things (IoT) devices producing zettabytes of data per year. This growth will put much more pressure on both the networks and the legacy data stores, such as existing data warehouses and Hadoop data lakes. At the same time, the critical nature of many emerging IoT and edge applications, such as autonomous vehicles and remote medical procedures, put the onus on operators to properly manage and utilize data, to ensure the networks underpinning these services are as reliable and robust as possible.

5G will bring additional challenges related to quality of service, network monitoring, customer offerings and segmentation, operational issues, and more. If operators were challenged with handling the big data of 4G, then 5G takes this to another level. They will need to better manage, access, and analyze their data to ensure quality, security, and customer experience.



Legacy data warehouses and data lakes will simply not hold up to these challenges on their own, as they are unable to facilitate the accelerated analytics of these massive amounts of data.



It will be crucial for operators to optimize and maintain network operations at the highest levels for ongoing quality of service. Customer data will need to be analyzed on a continual basis to uncover customer trends, and provide better customized services and offerings. Operators will need to secure networks and data by rapidly analyzing potential threats to detect anomalies that could lead to disruption of service or data breaches.

Legacy data warehouses and data lakes will simply not hold up to these challenges on their own, as they are unable to facilitate the accelerated analytics of these massive amounts of data. Data will continue to grow at a faster pace than ever before, but in many cases, it will be ingested into existing legacy systems that cannot keep up. Inefficiencies in the data pipeline and other technological restrictions will be magnified.

The amount of data that is currently being analyzed is only a subset of the entire data store, leaving many critical insights out of reach. The deployment of multiple new applications combined with exploding data stores will further compound the challenge. Areas that will be directly affected are network operations, quality of service and identification of performance issues, the ability to tailor customer offerings and experience, and cyber security and threat detection.

SQream provides a massive data analytics acceleration platform, which enables telecoms to rapidly access and analyze their massive data, and significantly reduce the execution time of long-running queries, to maximize their competitive edge and bring 5G opportunities to fruition. With unprecedented speed and flexibility, operators can uncover previously inaccessible insights about their infrastructure and customers, enabling superior customer experience with high quality and reliable service levels.

REAL WORLD EXAMPLES

SQream is successfully deployed in telecoms around the world, across different lines of business – in network engineering, marketing, security, and for value-added services. The following are real-world examples of how SQream is being used to help drive telecom businesses around the world.



LG U+ CUTS ANALYTICS FROM HOURS TO MINUTES, ENHANCING SERVICE FOR MILLIONS OF SUBSCRIBERS

LG U+, the mobile carrier owned by LG Corporation, launched 5G services in December 2018. LG U+ wanted to improve network operations and efficiencies, reduce costs and downtime, and offer better quality of service to customers. These are a few examples of the game-changing processes they wanted to implement:

- The LG U+ Customer Service team needed to analyze, understand, and predict customer usage from the massive data generated from millions of users. This process was taking hours and sometimes days due to extremely long-running queries. They needed the ability to rapidly “slice and dice” their data.
- Network Engineering needed to better understand and model the noise on a call using frequency analysis to classify good quality calls. The data was gathered from multiple sources, and manually curated in a process that could take hours for each model. They needed to be able to rapidly update their models for better decision making while the data was still relevant.
- The Security team used a machine learning-based operation for analyzing data from multiple security sources in order to detect and prevent cyber and DDoS attacks on the LG U+ network. The operation had two parts - the training of the models and the execution. During the training phase, it was critical to sample as much data as possible, which could not be done with their existing system.

LG U+ chose SQream as their data analytics acceleration platform for its ability to rapidly ingest, compress, and analyze massive amounts of data, while meeting key performance indicators. LG U+ was able to significantly increase the amount of data they analyzed, while reducing long-running queries from days to hours, and hour to minutes.



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ANALYSIS OF TRILLIONS OF GEO-RECORDS REDUCED FROM TWO DAYS TO FIFTEEN MINUTES

Smart network planning and capacity management is required to ensure excellent quality of service, maximum use of resources, increased capacity, and reduced costs. It requires the collection of massive amounts of network, signal, and geographical data, and antenna parameters including azimuth, aperture, gain, and more, and the analysis of the data to understand where to put investment or update the mapping of cell towers and associated equipment.

Network cell towers have multiple devices that emit signals to specific ranges. As the signal moves away from the cell tower, the signal loses strength and experiences path loss. In order to plan for network capacity, it is necessary to calculate path loss for every coordinate within a geographic area for any kind of device range. The calculations are mapped by dividing the geographical cells into grids in a raster format, which includes the cell tower to understand where signals are strongest, and where, based on path loss calculations. In areas where there is overlap of coverage from multiple cells, the maps are normalized by an optimization algorithm, and a heat map is created of the overall geographic area for the rest of the network planning processes.

In this use case, the number of data points that needed to be analyzed amounted to trillions of records, with lengthy and recursive query processes. Current data query times to produce the basic results required were in the area of two and a half days. The operator needed to significantly reduce the processing time to reduce costs and improve network quality. SQream was able to cut the query times from two and a half days to just over 15 minutes.



In order to digitalize ourselves within network planning and deployment, we need to digitalize the foundation of our network. SQream is the enabler in this journey.

AIS TRANSLATES BILLIONS OF SILOED RECORDS INTO ENRICHED CUSTOMER SERVICE



Thailand's leading mobile network operator, AIS, operates in a highly competitive local market, and strives to differentiate itself by delivering an exceptional customer experience. In this use case, the company wanted to translate billions of records of siloed data into improved network management and customer service.

AIS's existing Greenplum data warehouse solution was unable to support their growing volumes of data, and required hours of data preparation that restricted drill-down. The company's BI users needed fast and cost-effective access to massive volumes of customer and CDR data.

AIS implemented SQream's data acceleration platform to reduce long-running queries, accelerate analytics, and enable new customer insights. With SQream, AIS could analyze a much larger percentage of their data store, achieving a detailed picture of their customers, rather than an aggregated overview. Performing deeper drill-downs and faster competitive analysis, the company's data and business teams could better target and enrich their customer offerings and experience.



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CELLCOM REDUCE DROP COUNT BY 90%, SAVING MILLIONS OF DOLLARS



With revenue from calls and internet activity decreasing across the industry, Cellcom, Israel's leading telecom operator, was under pressure to deliver a better product while keeping costs down. However, the company faced network problems that frustrated customers and rippled into the organization's customer support and network teams.

The company's existing solution involved manually performing analytics on week-old data, identifying technical issues only after they had already escalated. The option of installing network probes at the cell site's eNodeB would have cost millions of dollars.

Cellcom chose SQream as a cost-effective and highly efficient network analysis solution. A process was established to collect raw log data from eNodeBs, which was then parsed and converted to a relational format inside SQream. A Spotfire-based solution was implemented that allowed engineers to immediately identify and track throughput, drops, and anomalies.

In a very short time, Cellcom was able to identify a host of previously unknown issues, including a high drop-rate caused by a hard handover from the macro-cell to the femto-cell. Following the discovery, Cellcom was able to promptly fix the issue, reducing the drop count by 90%. With SQream, Cellcom could now identify network issues before they escalated, increasing engineers' productivity, and restoring customer satisfaction.



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ABOUT SQREAM

SQream provides enterprises with critical business intelligence from massive data stores. Global enterprises use SQream to analyze more data faster than ever before, while achieving improved performance, reduced footprint, significant cost savings, and the ability to scale the amount of data they analyze to hundreds of terabytes and more. SQream is available both on-premise and in the cloud.

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