



TELCO USE CASE

CASE STUDY

# End User Analytics on Mobile Networks

## AT A GLANCE

KX Telco is an integrated platform for ingesting, processing and analysing massive amounts of real-time, streaming and historical data from networks, devices and other data sources to support, improve and automate a number of operations and business processes ranging from network planning and CRM support to fraud detection and performance analytics.

**It is generally acknowledged that data is the new oil and that industries need to tap the insights it contains. It is also acknowledged that it is a big challenge.**

The telecommunications world is particularly replete with data – every user interaction generates swathes of data that may contain valuable information on the networks, services and devices they access. Aggregate that over millions of customers and thousands of services and it may reveal valuable insights into the condition, performance and quality of the network. The problem is realizing it.

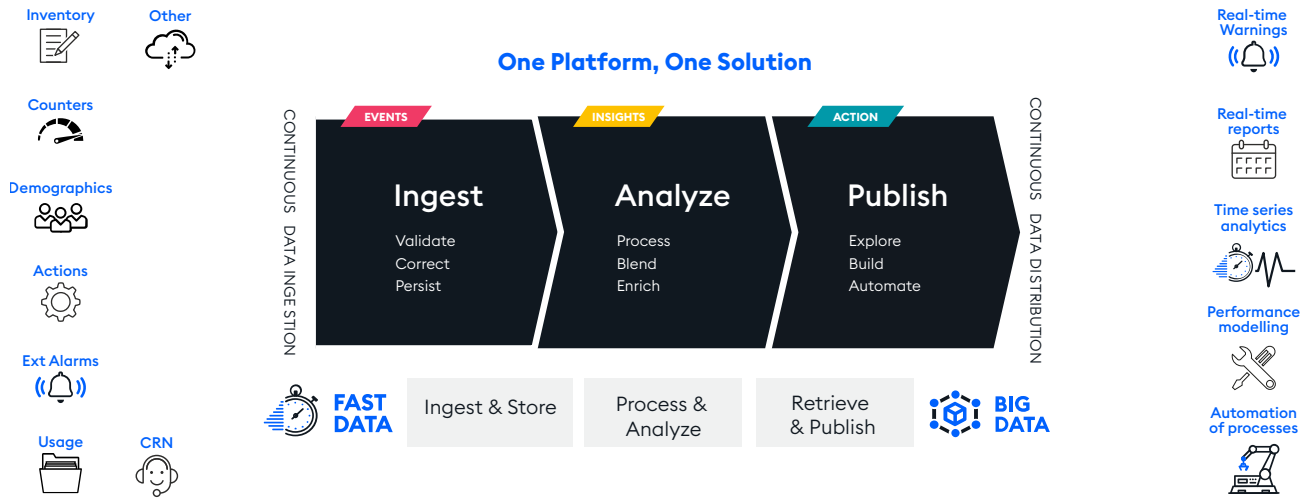
While subsets of the data may be used in isolation in areas like billing or coverage testing it is in its aggregation, and particularly its real-time nature, that the real value lies. But traditional databases struggle with the volume and velocity of big fast data. That's where KX and its time-series database, kdb+, excels. Kdb+ is the world's fastest time-series database and it enables network operators to combine vast amounts of streaming and historical data in a single solution.



**From service assurance or network and SLA optimization to user data monetization, the potential for extracting value from the mountains of telco data is unlimited.**



## KX Telco Analytics Platform



### STREAMING AND HISTORICAL TIME-SERIES

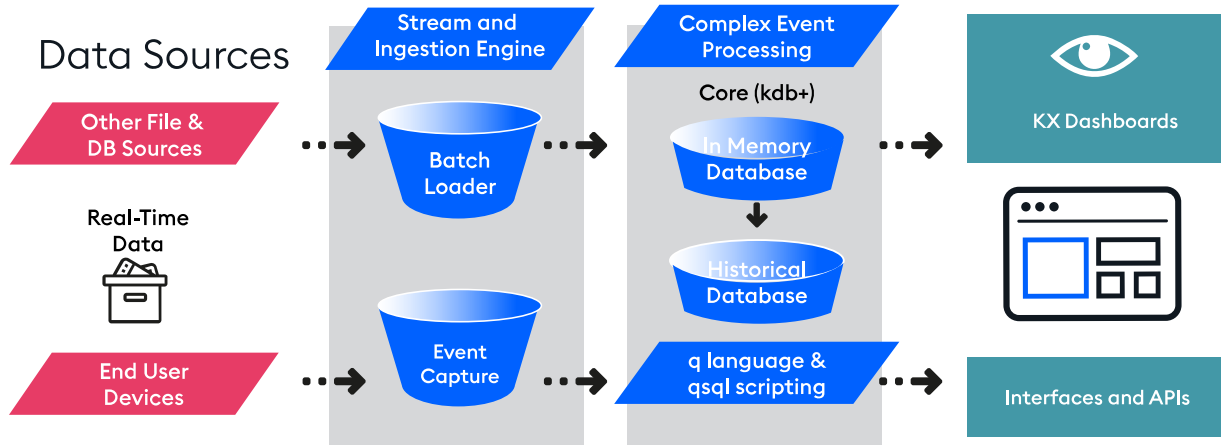
In this use case, we will focus on the end user side in mobile networks. Every mobile device generates and collects data related to its interaction with the networks serving it. This data is ingested in real time into the KX platform via an event capture module where each entry is time stamped and logged for fail-over protection. Alternatively, for more static data, ingestion can be via the Batch Loader Module.

The data is then passed to the in-memory Complex Event Processing (CEP) engine where it is processed in real time to give instantaneous updates in identifying trends in usage and demand, what if-analyses, simulations and integrating with Machine Learning libraries for deep learning capabilities. Sample analytics based on end use data may include:

- Real-time location and quality checking
- SLA fulfilment for corporate networks or VIP groups
- Network quality monitoring
- Automated load balancing and optimization

Analytics within KX Telco are defined using q, the integrated programming language embedded in kdb+. This direct integration of database and programme language enables much faster processing of data than traditional approaches that have to extract and process the data elsewhere rather than working on it directly. It is further accelerated by the vector design of q which is optimal for processing time-series data. Alternatively open sources languages like Python and R can also be loaded into the memory address space of the database so machine learning libraries like NumPy, Keras, Theano etc can be leveraged and operate on the data directly as well. Older data is persisted to disk but is quickly retrievable for combining with streaming data as required for historical analysis and machine learning. KX Dashboards, the visualization layer of the platform, enables rich and intuitive HTML5 visualisation of results across multiple devices. Dashboards also support ad hoc queries into the data.

## KX Telco Application Framework



### STREAMING AND HISTORICAL TIME-SERIES ANALYTICS OVER A SINGLE PLATFORM

This use case considered data from end user devices alone but the platform is virtually unlimited in the sources, volumes and analytics it can process. An obvious enhancement in this case would be the addition of network data, such as RAN counters, to provide a more holistic view and support even deeper analytics. More exciting still are the machine learning opportunities afforded by a platform with out-of-the-box support for popular machine learning libraries such as TensorFlow, Theano and Keras. With embedPy clients can bring their existing Python scripts to utilise on the data.

### Want to see how it works? Contact Us

#### KX and the future of mobile networks

The rollout of 5G and network virtualisation technologies, along with innovative real time and low latency services, heralds a new world for operators and users. Machine Learning, an Artificial Intelligence that paves the way for automation of processes and eventually zero-touch network management. Edge computing will enable taking action as close to the event as possible, both in the network and on devices. Kx, with its long pedigree in processing both streaming and historical data and its almost unlimited scalability, offers the ideal platform for the next-generation real-time telco solutions.

**Please visit [kx.com/solutions/telco/](https://kx.com/solutions/telco/) for more information and use cases.**