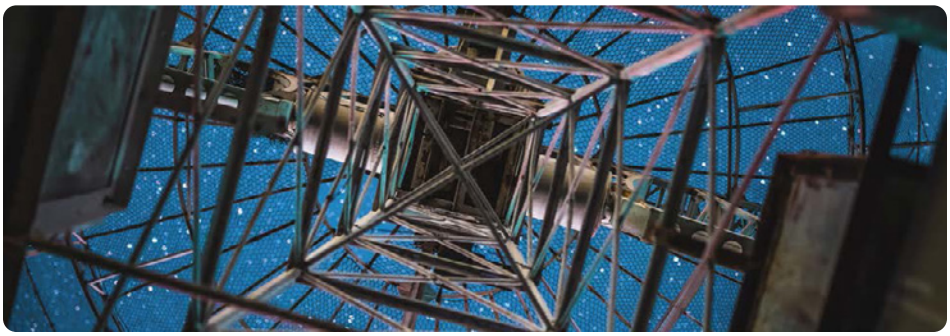
INDUSTRY FOCUS | TELECOMMUNICATIONS

Making the Connection

How CSPs can drive business value with a true hybrid platform



40%

Telecom operators can reduce costs by up to 40% using machine learning and applied analytics.

Source: McKinsey, "A Future for Mobile Operators: The Keys to Successful Reinvention," February 2017.

Faced with increasing competitive pressures, plateauing mobile revenue growth, and growing consumer demand for digital content, today's leading Communication Service Providers (CSPs) are embracing a digital transformation journey, one that's underpinned by data management and analytics initiatives.

To make the most of the increased volume, variety, and complexity of data and gain the enterprise data insights that drive business value, CSPs need to be able to handle any data, anywhere from the edge to AI.

The Role of Analytics in Telecom

CSPs are steeped in data, including customer profiles; device, network, and location data; customer usage patterns; apps downloaded, content preferences, clickstream data, so on and so forth. No longer just facilitators of communications, CSPs increasingly stand at the center of the digital service experience, and they are leveraging data as a key business differentiator.

CSPs today rely on data analytics to enable a range of key business use cases across multiple domains including:

- **Customer experience management —** A 360-degree view empowers CSPs to maintain market differentiation by improving and optimizing the customer experience. They can leverage customer profiles and usage data, network performance metrics, location data, and social media streams to enable targeted marketing, develop personalized offers and recommendations, and predict and prevent churn.
- **Network optimization and intelligence —** Complex analysis of usage, mobility patterns, network logs, hardware bottlenecks, peak loads, and other granular details enables CSPs to optimize network utilization, predict demand patterns, and make informed network expansion decisions network expansion decisions.
- **Operational analytics —** Data and analytics are driving internal efficiencies and process improvements around core Telco operations. From plugging and minimizing revenue leakage, managing network, and cybersecurity, driving down order-to-activation lead-times to proactively identifying and fixing customer issues in order to minimize truck rolls.

- **New business and digital services —** CSPs are seeking to drive future revenue streams through new, data-driven business lines and digital services, including monetizing 5G and support for IoT and other connected systems such as smart cities and connected vehicles. Beyond just providing connectivity, CSPs are starting to play an active role in providing end-to-end solutions for IoT analytics, data monetization, and more.

10

of the world's top Communication Service Providers run on Cloudera.

Key Telco Use Cases

Here is a summary of some of the key use cases that CSPs are focused on across the four domains

Customer Experience Management

- Churn Analytics
- Next Best Offer/ Action
- Campaign Optimization
- Targeted Marketing/ Personalization
- Location Bases Promos
- Proactive Care

Network Optimization & Intelligence

- Real-Time Network Analytics
- Next Best Network Investment
- Dynamic Network Provisioning
- Customer Aware Network Prov. (NFV)
- Predictive Network Assurance
- Network Decommissioning

Operational Analytics

- Cyber Security
- Fraud Analytics
- Revenue Assurance
- Event Aggregation
- Maintenance Optimization
- Truck Roll Optimization

New Business & Digital Services

- IOT & Connected Ecosystems
- Smart Cities
- Connected Cars
- 5G Monetization
- Industry Brokerage
- Security-as-a-Service

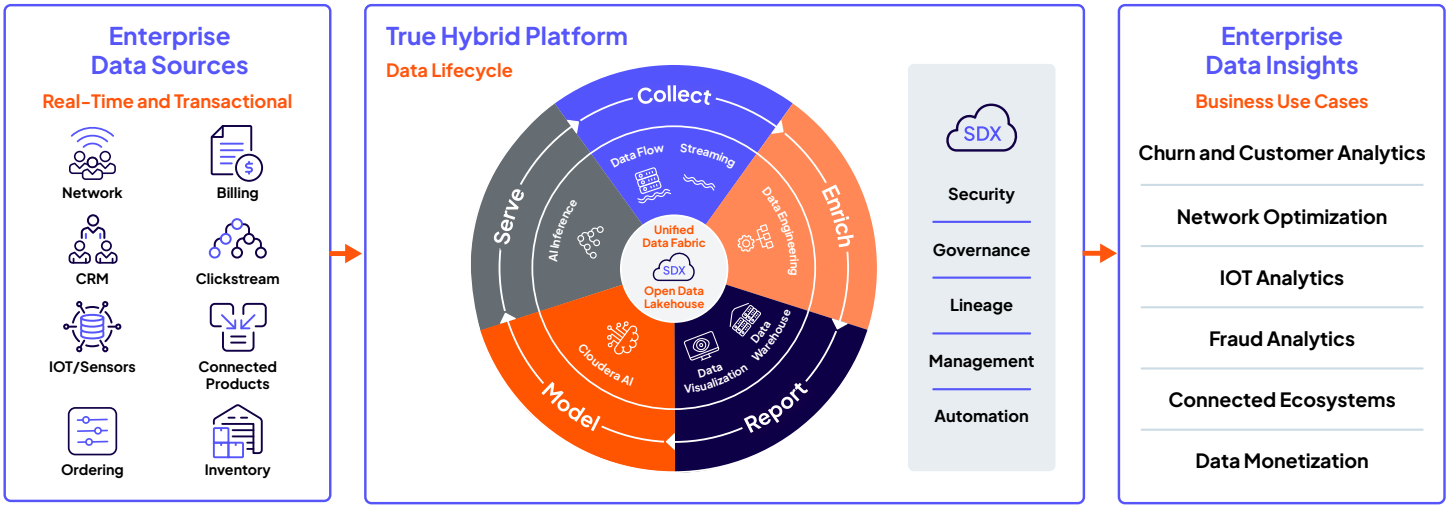
Managing and Securing the End-to-End Data Lifecycle for Telcos

In order to enable these and other compelling use cases, CSPs need to be able to easily utilize and process raw data coming in from a multitude of sources and drive insights and action in real time.

Today, CSPs want the ability to ingest, process, store, analyze, model diverse types of data (structured, unstructured, or semi-structured data), in a unified platform, regardless of where it lands — at the edge, on premise, in their data center, or in any public, private, or hybrid cloud.

They need to ingest and process data from multiple sources, combining and correlating network, customer, and device data with IoT data, activity logs, location, billing and rating data, OSS data, CRM data, external data, and much more. They also need an integrated suite of proven and open data management tools and analytics engines, in order to drive insights and analytics from all of this data — all with the robust security, governance, data protection, and management capabilities that operators require.

Today, leading Telcos worldwide are adopting a true hybrid platform strategy using Cloudera to manage the end-to-end data journey from ingesting data from multiple sources, to storing, processing, serving, analyzing and driving actionable insights and use cases.



With Cloudera, CSPs can ingest data from a variety of sources including both streaming and enterprise data sources, store and process it across a hybrid infrastructure, and run analytics or apply machine learning algorithms to all data, all while maintaining strict enterprise data security, governance, and control across all environments.

Adopting a true hybrid platform strategy using the Cloudera platform brings the Data Lifecycle to life and empowers CSPs to put their data to work. It breaks down as follows:

1. **Collect —** Any data journey starts with the ability to ingest and collect raw data, from diverse internal and external data sources. With Cloudera Data Flow , CSPs can easily ingest and process data from multiple sources, including both traditional as well as new and streaming data sources such as IoT and connected devices. Cloudera Data Flow provides a scalable, real-time stream processing and analytics engine that ingests, curates, and analyzes data for key insights and immediate actionable intelligence.
2. **Enrich —** Preparing data for analysis and insights is the foundation of any data-driven exercise and Cloudera Data Engineering helps enrich, transform, and cleanse a wide variety of data and makes it easier than ever to create and execute end-to-end data pipelines. You can enrich the data, build and manage end-to-end data pipelines, and make it available via Cloudera's Shared Data Experience (SDX) for machine learning or operational and analytic use cases.
3. **Report —** Traditional data warehouses are inadequate to meet the increased scale, economics, and analytics demands that today's Telcos are experiencing. Cloudera Data Warehouse offers an auto-scaling, highly concurrent and cost effective analytics service that ingests high scale data anywhere, from structured, unstructured and edge sources. It supports hybrid and multi-cloud infrastructure models by seamlessly moving workloads between on premises and any cloud for reports, dashboards, ad-hoc and advanced analytics,including AI, with consistent security and governance. Cloudera Data Warehouse offers zero query wait times, reduced IT costs and agile delivery.
4. **Serve —** The Cloudera Operational Database serves traditional structured data alongside new unstructured data within a unified end-to-end open-source platform. Cloudera Operational Database enables stream processing and real-time analytics on continuously changing data, ensuring the latest data and analysis can be injected

The Cloudera platform enables CSPs to ingest data from a variety of sources — both streaming and enterprise data sources — store and process it across a hybrid infrastructure, and run analytics or apply machine learning algorithms on all data, while maintaining strict enterprise data security, governance, and control across all environments.

into decision making. Users can serve real-time data at scale, with high concurrency and low latency. They can serve up data science at scale in order to build, test, iterate, and deploy machine learning models into production.

5. **Predict —** CSPs can close the loop on the Data Lifecycle by using Cloudera AI to make predictions that in turn drive key business outcomes. Cloudera AI can help operators accelerate data science at scale to build, test, iterate, and deploy machine learning models into production by taking advantage of massively parallel compute and expanded data streams. Using Python, R, and Scala directly in the web browser, Cloudera AI delivers a powerful self-service experience to data scientists to develop and prototype new machine learning projects and easily deploy them to production.
6. **Data security and compliance —** All of this needs to be underpinned by best-in-class enterprise grade data security, governance and compliance capabilities. Cloudera SDX provides this enterprise wide data security and governance fabric that binds the data lifecycle. SDX enables data and metadata security and governance policies to be set once and automatically enforced across the data lifecycle in hybrid, private or multi-cloud environments.

Looking Forward

For communication service providers looking to reinvent their data management and analytics strategy in this era of data-driven business, a multi-function, open, end-to-end platform makes it possible to generate the enterprise data insights needed to drive business value across multiple key use cases. Having these end-to-end data lifecycle components integrated into a unified and secured platform empowers CSPs to effectively address their most compelling use cases, driving the customer experience, guiding network optimization, delivering operational analytics, and empowering CSPs to expand their business offerings.

Learn more about Cloudera and how Cloudera is transforming telecommunications.

Why Cloudera

Hybrid and Multi-Cloud
Run your analytics on the clouds you choose. Easily and securely move data and metadata between on premises file systems and cloud object stores.

Analytics from Edge to AI
Apply real-time stream processing, data warehousing, data science and iterative machine learning across shared data, securely, at scale on data anywhere.

Security and Governance
Use a common security model, role and attribute based access policies and sophisticated schema, lineage and provenance controls on any cloud.

100% Open
Open source, open compute, open storage, open architecture and open clouds. Open for developers, partners, and open for business. No lock-in. Ever.

CLOUDERA

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Cloudera is the only true hybrid platform for data, analytics, and AI. With 100x more data under management than other cloud-only vendors, Cloudera empowers global enterprises to transform data of all types, on any public or private cloud, into valuable, trusted insights. Our open data lakehouse delivers scalable and secure data management with portable cloud-native analytics, enabling customers to bring GenAI models to their data while maintaining privacy and ensuring responsible, reliable AI deployments. The world's largest brands in financial services, insurance, media, manufacturing, and government rely on Cloudera to be able to use their data to solve the impossible—today and in the future.

To learn more, visit Cloudera.com and follow us on LinkedIn and X.