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Communication Service Providers

DATA ANALYTICS AND AI ARE EMPOWERING TRANSFORMATION

Communication service providers (CSPs) are at the threshold of a major transformation of their operations and business models. The transition to 5G networks and the proliferation of the Internet of Things (IoT) gives CSPs an opportunity to create a wide range of new offerings and revenue streams by enabling compelling use cases such as smart cities, connected factories, self-driving vehicles, data exchanges and many more.

Leading players such as AT&T with its IoT offerings, Deutsche Telekom with its Data Intelligence Hub, and Verizon with Verizon Hum are just a few selected examples of how CSPs are already exploring paths to extend business models beyond transport to provide analytics-based, value-added services to businesses as well as end consumers.

With 5G and the IoT rolling out in force over the next few years, the ground for innovation has never been more fertile. And while 5G and the IoT are vital to driving CSP transformation, they are not the only factors. For their traditional lines of business, CSPs can benefit from using data and analytics to drive major improvements in customer experiences, network optimization, cybersecurity, fraud prevention, compliance, business operations and more.

The underlying element driving all of this transformation is data—specifically using advanced **data analytics, machine learning, artificial intelligence (AI)** and other data-centric technology advances. To provide a sense of the magnitude of this shift, the use of AI in the telecommunications industry is growing at a staggering pace of 46.8% and expected to reach nearly $2.5 billion by 2022.[1]

For CSPs, the opportunities to leverage data intelligence seem boundless. Because CSPs generate and aggregate more data than perhaps any other industry—and because they are the hub for connecting data to businesses and consumers around the world—they are in a unique position to use data to empower digital transformation for themselves and their customers.

The question for CSPs is how best they can extract and maximize the benefits of analytics and intelligence across all of their data sources to achieve this transformation. This must encompass all data, including traditional telco data sources—such as CRM data, billing and ordering data, network/OSS data, and marketing and operational data—as well as new and emerging data sources such as IoT and connected devices, clickstream data, image and video feeds, external data sources and more.

This industry brief examines how CSPs can use advanced analytics and AI to drive new revenue streams, starting with the transition to 5G and the IoT. We explore how to exploit data to improve operations, including network performance, cybersecurity and fraud prevention. We discuss what to look for in a data platform for advanced analytics and AI, and why solutions from Cloudera and IBM are leading the way in empowering CSP transformation.

1 "AI in Telecommunication Market — Global Forecast to 2022," MarketsandMarkets, February 2018

5G MARKET OPPORTUNITIES ($BN)

Source: IDTechEx Research

By 2030, 5G will contribute

$700Bn

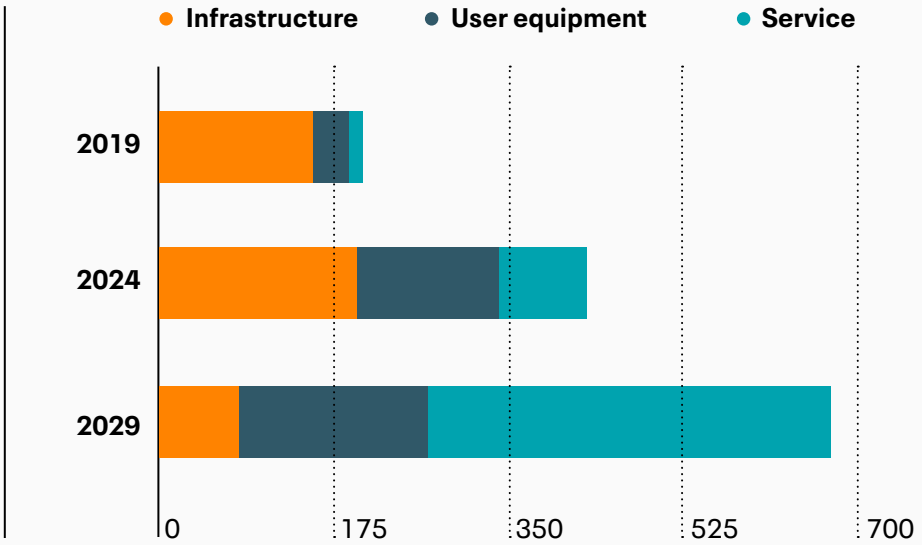
to the global economy with a CAGR of

20%

In the next 10 years, telecom operators will invest up to

$1.5Tn

to roll out 5G globally



5G, IoT and digital services

By 2030, 5G networks are forecast to contribute $700 billion to the global economy with a compound annual growth rate of 20%. CSPs are expected to spend upwards of $1.5 trillion to roll out 5G networks and services.[2]

In concert with this transition to 5G, there will be an interrelated explosion of IoT devices across all industries. One study predicts that the number of IoT devices will reach 125 billion by 2030, with global data transmissions increasing by a whopping 50% per year over the next 15 years.[3]

All of this growth and innovation spells massive, unparalleled opportunities for CSPs to expand their services, create new revenue streams and transform their businesses. It's not just about providing transport and connectivity; it's all about delivering added value. To give a sense of the potential, here are just a few opportunities that 5G can unlock for operators.

Enhanced mobile broadband: Faster speed, lower latency and greater capacity could enable on-the-go, ultra-high-definition videos, virtual reality and other advanced applications.

Internet of Things: With the explosive growth in the number of connected devices, existing networks are struggling to keep pace. The advent of 5G will unlock the potential of the IoT[4] by enabling more connections at once (up to 1 million per square kilometer) at very low power. This could create additional monthly revenues for carriers, but average IoT revenues will be a fraction of those for mobile broadband because of low usage.

2 "Get Ready for the 5G Revolution with IDTechEx Research," IDTechEx, June 6, 2019
3 "The Internet of Things: A Movement, Not a Market," IHS Markit
4 "Insights on the Internet of Things," McKinsey & Co.

5G HAS THE POTENTIAL TO UNLOCK MULTIPLE OPPORTUNITIES

Source: McKinsey & Co., European Commission

What is 5G?

5th generation mobile technology in response to:

- Mobile traffic doubling every two years
- The need to ensure capacity, performance levels and security meet future connectivity needs

Defining elements of 5G

- Enhanced mobile broadband
- Massive machine-type connections
- Ultra-reliable low-latency communications

Potential use case categories

Enhanced mobile broadband	• Faster speeds, lower latency • On-the-go, UGD-type videos • AR/virtual reality
Fixed wireless access	• Potential to deliver speeds >100Mbps to homes (alternative to wired broadband)
IoT	• New revenue streams by enabling more connections at once between IoT devices
Mission-critical application	• Use cases requiring low latency and time-critical contexts

Industry application examples

Healthcare
- Remote health monitoring
- Remote surgeries

Manufacturing
- Smart factories

Automotive
- Autonomous vehicle
- Driver Assistance

Utilities
- Smart grids

Mission-critical applications: This represents a new market opportunity for mobile technology. This significant growth area for 5G will support applications that require high reliability and ultra-low latency connectivity with strong security and availability. This will allow wireless technology to provide an ultra-reliable connection for applications such as autonomous vehicles and remote operation of complex automation equipment where failure is not an option.

The value-add, invariably, is in the data and what can be done with the massive amounts of it—structured, unstructured and semi-structured—for all types of customers, both business and consumer.

As noted, we are already seeing examples from forward-looking CSPs that are launching innovative IoT solutions to enable this transformation. For example, Deutsche Telekom's Data Intelligence Hub provides a secure marketplace for data, analytics tools and intelligence to help businesses maximize data in their own organizations and industries. Verizon Hum is a connected vehicle platform that can be used for safety, maintenance, diagnostics, navigation and other value-added services for consumers, as well as businesses in transportation and supply chain industries.

These are just the tip of the iceberg. The enhanced mobile capabilities of 5G and unstructured data generated by the IoT, social media and other sources are enabling transformation across all industries, including healthcare, financial services, education, manufacturing, government and automotive.

CSPs can be drivers and partners in all of these industries because they are aggregators of data as well as the primary vehicle for data delivery, giving them the opportunity to look at a variety of potential revenue streams, including but not limited to:

- Enabling the IoT ecosystem for customers.
- Providing data analytics as a service (DAaaS).
- Curating, aggregating and mining data for customers and delivering tools they can use for their own analytics.
- Providing targeted IoT and mission-critical applications for specific vertical markets, such as healthcare, manufacturing, insurance and government.
- Building managed ecosystems such as smart cities and factories, data-driven supply chains, connected vehicles and connected marketplaces.

Data and analytics are already transforming core CSP operations

The data-driven transformation of the CSP industry goes beyond the exciting new opportunities that are emanating from 5G and the IoT.

For their existing businesses, CSPs are using advanced analytics, machine learning and AI to drive new revenue streams; reduce churn via better customer relationships and targeted marketing; reduce risk of fraud and cybersecurity gaps; enable more reliable regulatory compliance; and achieve dramatic cost savings in business and network operations.

Examples include:

Customer experience analytics: By applying analytics across key data sets, CSPs can create a true 360-degree view of customers using customer profiles, user data, network performance metrics, location data and social media streams. This aggregation of data can be used to predict and prevent churn; develop targeted marketing using real-time analytics; develop personalized offers and recommendations; improve the overall customer experience; and develop a deeper relationship with the customer.

Network optimization analytics: The network continues to be the biggest cost center for CSPs, consuming up to 40% of capital and operating budgets. Network optimization requires complex and fast

analysis of large data sets, including usage, mobility patterns, network logs, hardware bottlenecks, peak loads and other granular details. With advanced analytics and machine learning, CSPs can move to a new level in monitoring and managing network capacity, building predictive capacity models and prioritizing and planning network expansion.

Operational analytics: Ensuring peak operational performance is key to reducing costs, mitigating risk and growing revenues. Day-to-day operational data sources offer actionable insights across a CSP's organization, including revenue assurance, cybersecurity, fraud, financial forecasting and equipment maintenance. For example, big data analytics combined with machine learning and AI enable CSPs to collect and analyze log data, find anomalies and alert security teams. Advanced analytics, machine learning and AI enable CSPs to detect fraud in real time, minimizing false positives and identifying known and unknown types of fraud. According to research from the Communications Fraud Control Association, CSPs can discover up to 350% more fraud incidents using data analytics and machine learning.[5]

5 "Global Telecom Survey Sheds New Light on the Status of Fraud Within the Industry," Communications Fraud Control Association, Nov. 21, 2019

What to look for in a solution

The path to these transformative business benefits starts with data. Every opportunity discussed in this paper requires the ability to ingest, process, store and analyze any type of data, including structured, semi-structured and unstructured, in the data center, in public and hybrid clouds, or at edge locations.

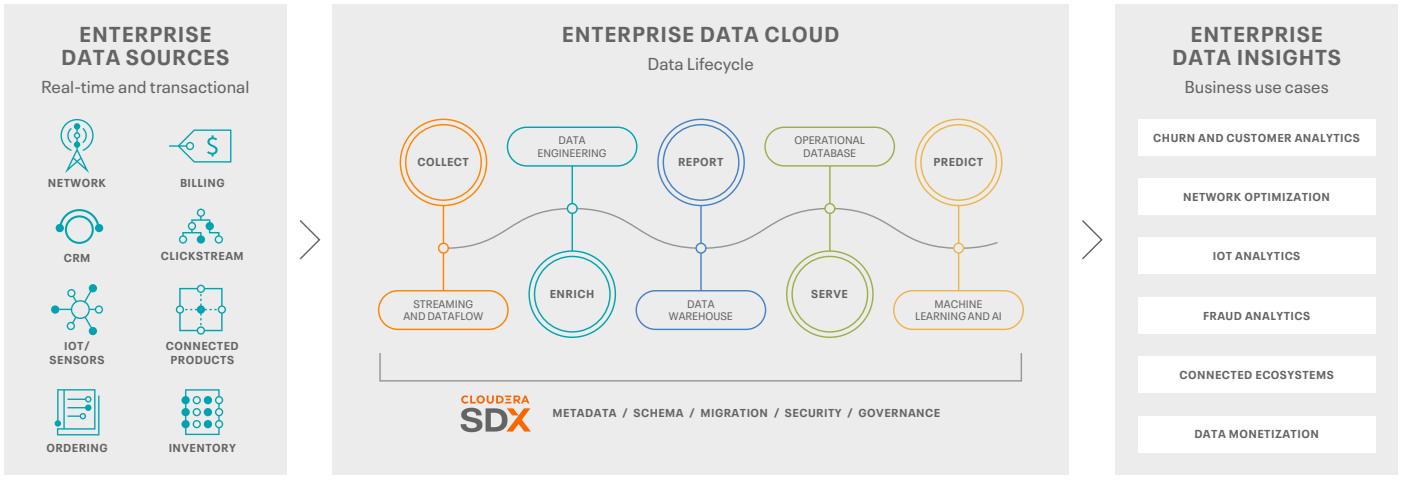
With the ability to analyze data-at-rest, data-in-motion and streaming real-time data feeds, CSPs can then leverage advanced analytics, machine learning and AI to identify patterns, detect anomalies and predict potential outcomes for their businesses.

To take advantage of this next generation of opportunities, CSPs need a unified platform to manage the end-to-end data lifecycle—from ingesting data from multiple sources to storing, processing, serving, analyzing and modeling it to drive actionable insights.

With a unified platform for data analytics and intelligence, CSPs can eliminate data silos and maximize the value of data at every stage of its lifecycle, thus improving governance, data security, protection and compliance. It is important for the data platform to have an open

MANAGE AND SECURE THE DATA LIFECYCLE FOR CSPS

A fully integrated data lifecycle makes it easier to drive business insights and use cases



architecture so CSPs can aggregate data from existing as well as new data sources. Single-pane-of-glass management is another important feature.

All of these capabilities are embedded into the Enterprise Data Cloud solution that is built on the **Cloudera Cloud Platform** (CDP), available through the tightly integrated partnership between IBM and Cloudera.

CDP offers data ingestion, data engineering, data warehouse and machine learning services; a data hub service for building custom business applications; and a unified control plane to manage infrastructure, data and analytic workloads across hybrid and multicloud environments.

This includes consistent data security, governance and control to safeguard data privacy, ensure regulatory compliance and prevent cybersecurity threats across all stages of the data lifecycle. The Enterprise Data Cloud is built on an open source foundation that avoids vendor lock-in and accelerates the path to innovation for CSPs.

The benefits of IBM and Cloudera

With an Enterprise Data Cloud, customers benefit by working with two companies that have a long history of leadership in providing advanced data analytics, machine learning and AI solutions to leading CSPs around the world. Benefits include:

Faster ROI with end-to-end capabilities that enable CSPs to use advanced analytics, machine learning and AI from data lakes and connecting clouds with traditional infrastructures.

Industry expertise to build an integrated vision to deliver specific opportunities for CSPs, from Customer 360 to fraud prevention to creating new revenue streams.

Security and governance, leveraging Cloudera's Shared Data Experience to ensure that all data is secure and governed at all times, anywhere, from the edge to AI.

Speed to innovation, with the largest number of contributions to the open source community, ensuring increased availability and interoperability across all vendors.

One-stop support to reduce costs, eliminate finger-pointing and maximize availability and agility.

Freedom of choice, which means flexibility to modernize existing on-premises infrastructure as well as leverage next-generation hybrid cloud and multicloud platforms.

Is your organization ready to reach the next level in using big data, advanced analytics, machine learning and artificial intelligence to drive new revenue streams, innovation and business transformation? It's time to find out what IBM and Cloudera can do for you. For more information, please review our **eBook: Top 5 Data and Analytics Use Cases for Telcos**.

CLOUDERA

At Cloudera, we believe that data can make what is impossible today, possible tomorrow. We empower people to transform complex data into clear and actionable insights. Cloudera delivers an enterprise data cloud for any data, anywhere, from the edge to AI. Powered by the relentless innovation of the open source community, Cloudera advances digital transformation for the world's largest enterprises. Learn more at Cloudera.com.

IBM

IBM builds data management products with the AI, hybrid, and multicloud future in mind. Its enterprise-grade solutions are designed for robust integration across security-rich environments. To assist with your data lake needs, IBM provides value-added offerings that bring these same benefits to Hadoop implementations like those created by Cloudera.