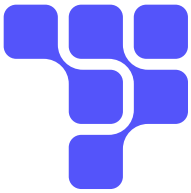
Top Four Data Management Trends in Telecommunications for the Next Five Years



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Telecom service providers are increasingly under margin pressure and driving towards digital transformation to help boost profitability while continuing to invest in 5G, 6G, and Fibre technology and seeking services innovation in B2B and related segments. These imperatives are best served by an organization that has deep insights into its operations (especially network) and customer behavior and can translate those insights into automated business processes through AI and advanced analytics techniques.

At the same time, the accessible telco data universe is continuing to expand exponentially, with more devices connecting to the network, more intensive connectivity in 5G and other architectures to support applications such as IoT and security, and finer granularity in information services available from virtualized and non-virtualized network infrastructure. Privacy and compliance around data will become increasingly prominent as a driver and as a constraint, and ensuring appropriate operations will become a critical factor. Public Cloud resources will add to the range of tools available to solve these challenges by introducing new requirements around governance and cost control.

The transformation of the data environment within telco operations will become a priority. Shifting from a set of silo data operations with countless 'skunkworks' data operations and independent projects in different parts of the business, telcos have a strong push to unify data processes. This is both to drive compliance assurance and cost containment. With these factors in mind, strong governance will be crucial — managing federated data processes, tight user access controls and auditability, data lineage, observability, and explainability for AI. The capacity to distribute data processing to the edge, offsetting the enormous volumes of data generated by increasingly intelligent devices, will optimize cost performance. Hybrid workload management — the capacity to shift consistently governed workloads between public clouds and to the data center — will help in cost and performance management and maximize the flexibility and agility offered by public cloud while avoiding cost overruns and vendor lock-in.

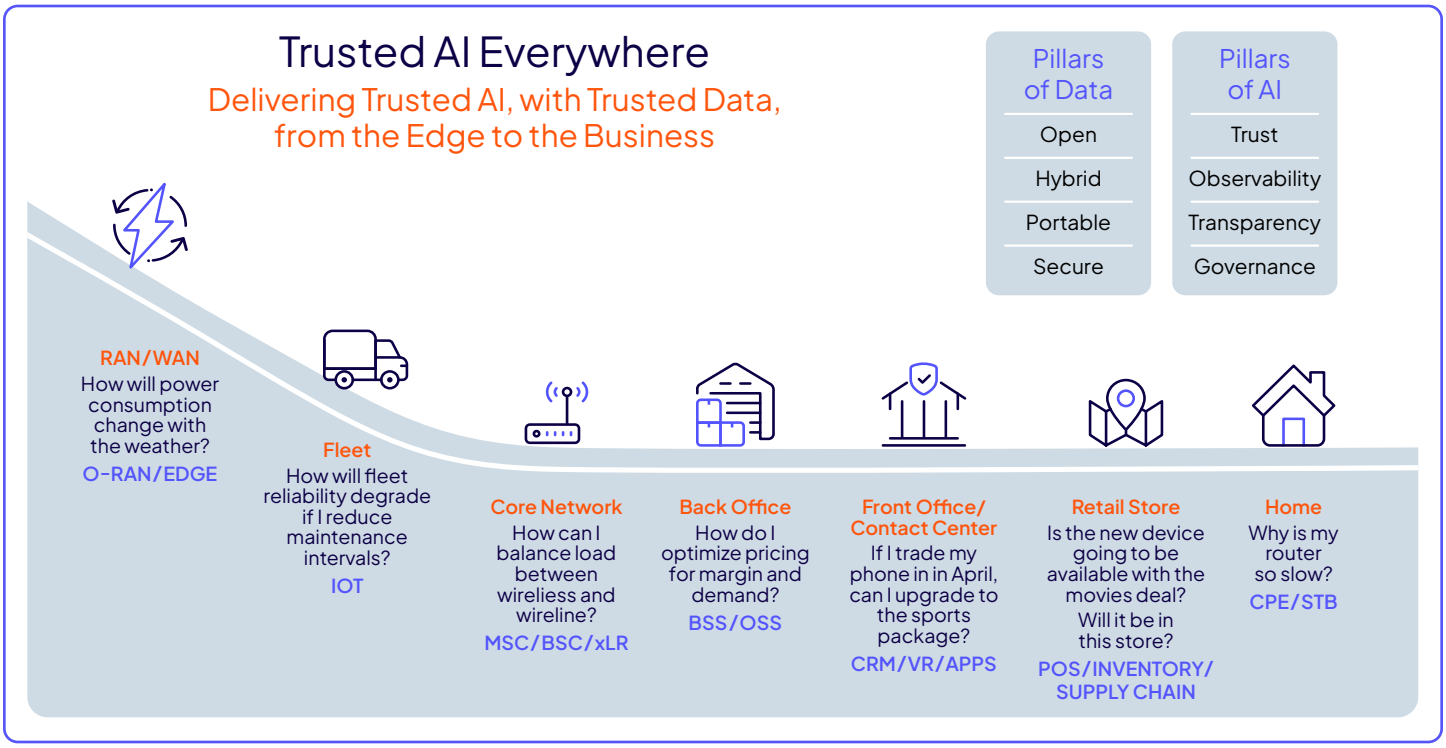
Data Sources Multiply and Scale

The telecommunications industry has long had extensive metering and logging across its service delivery infrastructure, much of which was ephemeral as the cost of processing and storage was prohibitive. In recent years, commodity hardware mass-produced in lower-cost manufacturing bases and accessed through virtualization technology has allowed the persistence of more and more data. For example, signaling probe data in a medium-sized network has the potential to deliver petabytes of data on a daily basis. On top of this, device data — from network devices, personal devices, and machines connected to the network, such as vehicles and manufacturing devices — have the potential to substantially increase this data. Carriers can enrich the connectivity offering by packaging data processing capabilities for connected operations, and 5G, 6G, and new technologies will present this as a significant opportunity. The extension of enterprise networking services through virtualized infrastructure further increases the range of network elements supported, each delivering masses of data about network and service performance, and that will each be managed automatically to drive down costs.

Automation Becomes The Key Driver for Operations Transformation

In the past two decades, enterprise transformation in telecommunications has been driven by simplification, outsourcing, and rationalization. Within regulatory constraints, service providers worldwide sought to leverage global technology partners to off-shore commodity services, reduce the number of applications, and focus on core services to drive margin growth. Today, however, the number one driver for margin appreciation is automation, specifically AI-driven automation.

AI-driven automation begins with predictive modeling across the enterprise and extends into machine learning for operational insights through large language models (LLM) for natural language interfaces and 'conversational' AI into the ultimate objective of closed-loop business process execution, as is common today in the contact center. However, Cloudera believes that the entire enterprise can be transformed with AI, from the edge of the network right into the heart of the business.



In the network, engineers, partners, and other stakeholders should be able to engage conversationally, using natural language, about network behavior and performance. Network resource allocation — including power, compute, and virtualized network components — should be dynamically (and automatically) allocated based on forecast requirements. Fleet should similarly be optimized and correlated against network performance, while in the core network, technology arbitrage (optimizing the balance and load between 5G, 4G, and Fibre, for example) should reduce the incidence of excess capacity while driving consistently excellent customer performance. In the back office, offers, products, and services are similarly optimized for margin growth, while automated guided customer support delivers timely and accurate service with strong NPS growth. Retail still plays a part in the go-to-market mix, but AI can help accelerate retail transformation through in-store service delivery. At the same time, in the home or in the customer premises, customers can manage their own devices with automated installation and maintenance assistants.

Governance and Observability Become Critical Operations

This vision of an AI-driven enterprise involves several moving parts, but at its core is a data platform that is both trusted and pervasive. This cannot mean a single data store or a single core application. It must be a federated platform that allows data storage, data workloads, and data policies can be applied separately depending on business imperatives, including cost, compliance, and agility. This will require on-prem and public cloud capacities. It will include processing at the point of data collection — often in the network or even in the customer premises — to execute automated processes or more immediately to aggregate and transform data collected into smaller quantities to offset the downstream load (for example, truncating unnecessary fields or aggregating records across time).

In such an environment, the role of governance and observability becomes critical. In the first instance, this ensures compliance with security and privacy requirements, but quickly, this becomes a set of levers and throttles to control cost and resources. Understanding where bottlenecks are forming, quickly onboarding new data sets and workloads, and exposing the critical data to upstream processes while maintaining compliance in a timely way will become differentiating capacities. Today's telco operations are often characterized by multiple independent public cloud instances, siloed operations in B2B and consumer, channels operating their own independent data science projects, and a privacy regime that focuses on billing and location data, while offering guidance on compliance to the rest of the business.

The AI-Driven Enterprise: Trusted AI Everywhere

At the end of the day, this comes down to trust. An AI-driven enterprise, getting the most out of automation and achieving margin goals that in the past have seemed impossible, will be one built on a trusted data platform. That means that the data itself is trusted, that its sources are verified, that its integrity is assured, and that it is comprehensive. It means that the data is not inappropriately exposed, that data operations are auditable and traceable, and that the people around the data — scientists, engineers, analysts, and developers — embed these principles into their work. Changes in the data platform — ingesting new data sources, supporting new applications, or retiring old ones — are seamless and adapt quickly to the data culture. All parts of the business will serve the platform and build their operations upon it once that trust has been established.

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