WHITE PAPER

Maximizing **Data Usage:**
A Strategic Guide for Telcos

Harnessing the Power of Data to Build for the Future

Contents

Introduction

For telcos, maximizing data usage is critical. And businesses must act sooner rather than later. Financial pressure is building, and the rising cost of capital means organizations must find more efficient ways to serve customers and reduce costs.

Over the last several years, telcos have invested significant amounts in network infrastructure — as well as deploying and developing 5G technology — yet returns are weak. In the European telecoms market, return on capital employed (ROCE) has declined year-over-year since 2018. In 2022, it **stood at just 5.8%**.

And the need for investments is not receding, as the nature of telecom networks is also shifting. Cloud technologies play an increasingly influential role, companies are trending toward greater virtualization of network components and 5G brings new possibilities, including more advanced network slicing.

Responsible for essential infrastructure and internet services, telcos have vast amounts of data at their disposal. From network and device data to consumer information like billing details, addresses and service history, telcos can leverage this to improve products, platforms and processes; deliver more satisfying customer experiences; and reduce costs.

Historically, telcos have capitalized on sales data, utilizing subscription, revenue-generating unit (RGU) and average revenue per user (ARPU) data to inform marketing campaigns and measure performance. Though telcos have worked hard to leverage holistic, customer-centric data, it remains relatively underutilized. This is changing as a combination of AI and competitive pressures force telcos to extract maximum value from all available data.

Similarly, Generative AI (GenAI) is accelerating development while also exposing the need for strong data management practices. Telcos are keenly aware that the intelligent application of GenAI is central to future commercial success and will be a crucial differentiator if leveraged appropriately. Increasingly, organizations also understand they must build on solid foundations and improve their data management and governance to fully exploit GenAI's potential.

Telcos' relationship with their customers also impacts the nature of technological evolution and implementation in the sector. Consumer trust remains a critical concern, and telcos are highly aware that they must nurture this relationship and retain consumer confidence. Errors, miscalculations and substandard customer experiences resulting from inaction or new, poorly optimized data-based technologies may tarnish this trust.

This results in a situation where telcos, motivated by the potentially transformative benefits of well-managed data and GenAI-enabled technologies, are also partly restrained by their relationship with customers and consumers. It is a challenging landscape to navigate — one that requires considerable data expertise and experience, a clear strategic vision and an understanding of the obstacles and opportunities organizations will encounter along the way.

In this white paper, we will explore potential use cases for telcos to maximize the value of their data, address the challenges associated with data initiatives and offer recommendations for developing an effective data strategy. Ultimately, you will walk away with an understanding of how a data program can enable your business to provide a better customer experience.

Examining How Telcos Can Leverage Data

Currently, the telecom sector is pursuing a two-fold approach, searching for ways to reduce operating costs through efficiency savings while identifying new revenue opportunities to improve the top line. Maximizing data usage is central to both processes, ensuring plenty of potential use cases.

Product Development & Innovation

Telcos must leverage data to develop new products and solutions, monetize their infrastructure and increase revenue. From health and wellness products and online digital security solutions to smart home innovations and mobile wallets, the potential for new products is significant. GenAI also enables developers to move faster and reduces development costs, eliminating obstacles to innovation. However, this also requires a culture shift.

While most organizations understand the need for data-based product development, opinion-based decision-making continues to influence product design and development. Though having a human in the loop is necessary, data must drive product development decisions. Telcos should leverage product usage data to identify successful features. Product owners must implement feedback mechanisms to refine products and prioritize fact-based design that reflects real-world usage.

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Preventing Customer Churn

As telco data usage becomes more focused, refined and extensive, it will enable companies to minimize customer churn and increase their overall lifetime value. Improved data usage coupled with AI technologies can identify patterns in customer behavior that suggest a risk of churn and take preventative measures. For instance, telcos can micro-segment consumers, isolate those most likely to leave and target them with personalized product offerings and recommendations. By repeatedly measuring the success of these targeted campaigns and refining the offers, telcos can automate proactive anti-churn measures.

Pricing & Marketing Intelligence

Telcos should utilize available data to segment customers according to demographic factors, including personas and behavior, among others. By doing so, they open up several possible use cases, including creating more effective marketing campaigns or facilitating more accurate customer targeting. For instance, data usage can help telcos identify customers who would benefit from 5G network slicing capabilities, potentially opening up new revenue streams.

Improved targeted upselling using richer data is also possible. For instance, telcos can utilize data to identify service issues and contact customers with solutions, such as Wi-Fi repeaters for larger buildings and residences. Here, data enables telcos to improve the ARPU. Sales processes are also ripe for transformation with companies exploring AI-driven sales experiences based on extensive customer interactions.

Examining How Telcos Can Leverage Data (cont.)

Customer Support

Maximizing data usage enables telcos to improve the customer experience by providing better support. In the short term, analyzing customer complaints and interactions enables telcos to improve agent scripts and refine responses.

But data can also facilitate more powerful self-help solutions. For example, an app could inform customers that a potential Wi-Fi issue is due to a poorly placed router or an old device. Or it could notify customers when there is an outage in their area and provide an estimated repair time. Going even further, it can even enable pre-emptive troubleshooting, allowing telcos to solve technical issues before the customer becomes aware of them. Early identification and quick resolution would improve customer satisfaction and positively impact consumer perceptions of service providers.

Moving towards a system in which customers only speak to a human agent when necessary promises considerable efficiency savings, reduces the cost of customer care, frees up time for talent to work on higher-value tasks and improves employee experience. That said, telcos can also use data to improve agent performance and training, using it to develop automated employee training and upskilling initiatives or as the basis for an assistant that helps new agents when handling calls.
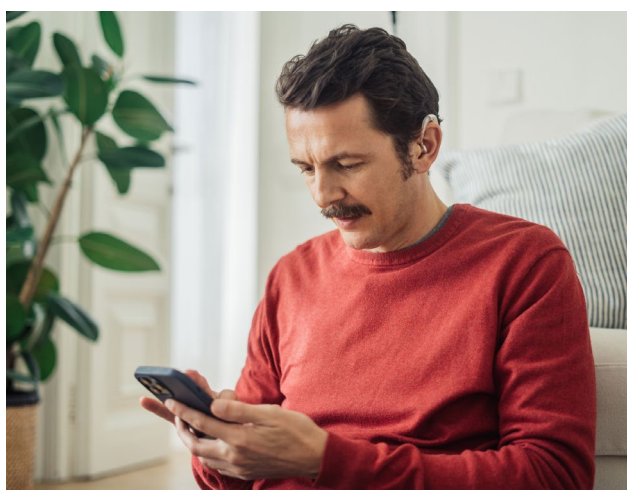
Network Optimization

Improved data usage also has significant implications for network optimization. The ability to identify patterns in network data enhances anomaly detection and allows for predictive maintenance, preventing outages or service disruptions and improving product quality. In doing so, predictive maintenance will prevent unnecessary dispatch of physical repair resources, creating a more efficient response system and reducing costs.

Closed-loop automation — the continual, real-time assessment of network conditions in order to optimize resource utilization and improve service quality — is also a possibility as are self-healing networks, which rapidly detect and even preempt network issues that could cause outages. Today, telecom networks are evolving rapidly. Emerging technologies like OpenRAN (O-RAN) allow for greater data observability across an entire network, reduce capital expenditure by promoting open source software, and improve component interoperability and network scalability.

At the same time, data can be better utilized to inform network planning and infrastructure investment. From a commercial and financial planning perspective, an accurate and nuanced understanding of network usage and data flows gives telcos a more detailed insight into where investment is required in the coming months and years.

Integrating GenAI into these areas presents opportunities to streamline operations further. For example, combining complex anomaly detection algorithms with natural language interfaces could empower less skilled operators to troubleshoot network issues more effectively.

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Recognizing the Challenges Inherent in Data Initiatives

Telcos know there are challenges and obstacles involved in data initiatives. While some challenges are unique to individual organizations and reflect their history and current circumstances, many are industry-wide issues. If unresolved, they will hamper and delay digital transformation and limit the benefits associated with improved data management, analysis and application. Below, we walk through some of the most common ones — and what you can do about them.

Ownership & Data Democratization

Data ownership is a significant challenge to maximizing data usage in telcos. Ownership dynamics within companies can be complex, with different departments often prioritizing the protection of their respective data domains. Telcos may also have acquired companies with different systems, built products with distinct backend systems or worked with vendors that weren't able to scale appropriately to serve their needs. This can result in a complex data landscape.

Balancing the interests of various stakeholders, including network teams and consumer-facing departments, is crucial to navigating ownership issues effectively. Alongside this, issues often arise as telcos grapple with the question of who should lead data initiatives and oversee AI implementation. Telcos must establish clear leadership and ownership to drive these efforts effectively — likewise for data democratization. Organizations must consider how they will navigate the management and accessibility of data drawn from multiple teams and digital systems, not all of which are optimized for seamless communication.

Data Integrity

The sheer amount of data available to telcos can be overwhelming and often results in concerns over integrity, a concern that carries strong implications as accuracy impacts the quality of outcomes directly. Data is at the heart of all business operations for telcos and plays a crucial role in network optimization. It also affects the customer experience, with poor-quality data leading to frustration and churn.

Common complaints surrounding inaccurate billing, incorrect personal information or service availability discrepancies often originate in low-quality data. It can result in ineffective product segmentation, frustrated employees and poor decision-making. Today, telcos collect and maintain more information and manage a larger number of systems than ever before.

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Guaranteeing data integrity is both challenging and absolutely essential to the success of all future digital initiatives.

Recognizing the Challenges Inherent in Data Initiatives (cont.)

Data Silos & Integration

Data silos reduce telcos' abilities to leverage data quickly, efficiently and cost-effectively. Eliminating data silos allows for a more comprehensive view of customers, network performance and business operations, improving the value of available data in the process. For many telcos, current data management is a legacy of decades of freeform evolution during which systems developed independently and not according to an overarching data strategy or roadmap.

Formed when data containers strip data of semantics, data silos prevent easy integration and limit interoperability. Optimized for local organization consumption, they typically result in data that is application-centric. Such data is formatted to meet a specific application's requirements and specifications, rather than for wider use. In response, telcos must transition from an application-centric approach to a data-centric approach — prioritizing the creation of data that is independent of particular apps or containers and ensuring it is available and useable for various unforeseen purposes in the future.

Consumer Trust

Due to the nature of the industry, telcos are beholden to their customers making trust a critical factor to success. **Studies** show that telcos are second only to banks in terms of consumer trust. As a result, how they utilize, store and protect customer data matters. Consumer awareness of **data privacy issues is also increasing**, and customers better understand the potential implications of poor data management by service providers.

For telcos, this poses several challenges. First, it affects the speed and nature of their innovation. Telcos will want to thoroughly validate and control solutions before making significant decisions or rolling them out to the public. Second, it poses a communication challenge. How do telcos communicate the benefits of new data uses, tools and technologies to customers in an engaging, informative and appealing way?

Recognizing the Challenges Inherent in Data Initiatives (cont.)

From Static to Streaming

Historically, telcos relied on batch data, resulting in instances where they may be basing decisions on data that was an hour, day, week or month old. Now, the focus is on streaming data that flows continuously, allowing real-time analysis and decision-making. More than ever, telcos need to be able to move fast, increase operational agility, empower decision-makers to respond quickly and ensure they can adapt to new, emerging market conditions. Industry leaders will be the first to seize fresh revenue-generating opportunities, launch innovative products and exploit new markets.

This requires new tools and working habits, as well as technical and organizational change. Real-time insights based on up-to-date data underpin all these abilities. Hence the importance of data streaming. However, transitioning from static to streaming means overcoming the complexities associated with data volume, monitoring complex infrastructure and architecture, testing and debugging.

Skills Deficit

Talent deficit is an issue across all industries. A recent **EPAM report** highlighted that 65% of business leaders cite tech talent shortages as their number one business challenge. And the telecom sector is not immune to this. While telcos have invested heavily in specialist skillsets — ensuring they have teams capable of excelling in niche areas — there has been less focus on developing data experts who can operate across the entire organization, helping to unify and collate data in a centralized repository. This slows the transformation process considerably.

When it comes to data literacy, there also appears to be a notable gap between managerial expectations and the operational reality. **Research** suggests that almost 90% of C-suite executives expect employees to make data-driven decisions. However, only 11% of those employees consider themselves data literate. Overcoming this skills deficit should be a long-term priority of telcos.

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Read the report to learn more about business leaders' talent management challenges.

Developing a Coherent Data Strategy to Maximize Data Usage

While telcos clearly face a number of challenges, these are not insurmountable. However, overcoming them requires a coherent and comprehensive data strategy.

Normalize the Available Data

Data normalization involves "cleaning" the data to ensure consistency and compatibility across different data sources. Normalizing a dataset means reorganizing data by removing unstructured and redundant data, defining normal ranges for data parameters and identifying out-of-bound values. It is long, intensive work that requires data science and subject matter expertise.

But it is essential. It reduces data anomalies, ensures cross-compatibility between data sources and improves the quality of data analysis and insights.

Aggregate Data in a Central Data Lake

Telcos also need to consolidate data from diverse data pipelines, transitioning away from costly, opaque retainers that lack transparency and towards a centralized data lake. Organizations should identify priority pipelines and begin migrating that data to their chosen platform. Whether this is a cloud platform or an on-premises environment will vary from organization to organization.

The industry has yet to agree that a single data lake containing all data is optimal for large enterprises due to concerns over scalability and privacy. However, there is a consensus that more data consolidation generally produces better insights and a more valuable 360-view of the customer.

Define the Data & Architecture Visions

At the same time, telcos need to define their data and architecture visions and begin developing their strategic roadmap.

This involves three key steps:

01
Ensure the right stakeholders are on board. Work towards a position where all involved understand the significance of accurate data management and the benefits of consolidating data.

02
Establish a long-term strategic architecture for consolidating data sources. Often, telcos will have implemented diverse solutions, such as unique ordering and billing systems for different products. Developing a roadmap for consolidating these systems provides necessary direction.

03
Build a dedicated team within the organization with the freedom to focus on holistic solutions rather than specific use cases. Its ability to analyze various data sources, build abstraction layers and facilitate data utilization across the organization is invaluable.

Developing a Coherent Data Strategy to Maximize Data Usage (cont.)

Embrace an Innovative Mindset

To fully leverage data and drive transformation, telcos must cultivate an innovative mindset across their organizations. This involves fostering a culture that encourages experimentation, creativity, and agility. **Recent research** highlights that companies with a strong innovation culture are 3.5 times more likely to outperform their peers in terms of growth and profitability. Embracing innovation enables telcos to adapt quickly to market changes and capitalize on emerging opportunities, such as the rise of 5G and IoT.

Moreover, **one study** finds that 86% of executives believe that innovation is crucial for their company's success over the next five years. By promoting cross-functional collaboration and empowering teams to explore new ideas, telcos can enhance their data strategies and remain competitive in an increasingly digital landscape. Embracing an innovative mindset not only drives data utilization but also positions telcos to lead in the ever-evolving telecommunications industry.

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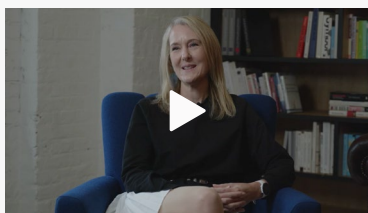
Establish Clear Data Ownership & Governance

For many telcos, the first step in maximizing data usage is clearly defining ownership structures for data and establishing robust governance frameworks. These steps are necessary to ensure data integrity, compliance with regulations and alignment with organizational goals.

For instance, adopting FAIR Principles (Findable, Accessible, Interoperable and Reusable) ensures data is collected, stored and managed in ways that prevent the creation of new data silos, reducing costs and ensuring data is ready for use. Crucially, this process must reflect the historical evolution of data management practices within organizations. Frameworks should reflect each telco's unique data environment.

In recent years, larger telcos have also demonstrated their desire to overcome these challenges by introducing new data-focused positions in their organizations. In 2019, Verizon hired its first Chief Data and Analytics Officer. Other companies have since followed suit, but there is still work to be done. **Only around 27%** of the world's largest publicly listed firms currently have a CDO.

Visualize the Data for an Improved Understanding

Effective data management extends to creating the tools, techniques and dashboards required to visualize the information and facilitate analysis. Visualization enables product managers, customer experience managers, data scientists and other experts to understand customer behavior, service usage patterns and network performance. These tools benefit from transitioning from static to streaming data, as this enables real-time insight into critical metrics.

Visualization is particularly crucial in the telecom sector, as the quantity of data collected makes interpretation and analysis difficult. Without dedicated visualization technologies, telcos may struggle to distinguish their best-performing products, prevent network delays, identify revenue assurance shortfalls or realize the many other benefits offered by data-informed optimization.

Developing a Coherent Data Strategy to Maximize Data Usage (cont.)

Prioritize Internal Use Cases & Efficiencies

When prioritizing use cases for leveraging data, telcos should opt for internal applications first. These use cases may not represent the largest cost savings or generate the greatest revenue, but they provide telcos with an opportunity to implement new data technologies and practices in a controlled environment, where potential errors will not impact customers directly.

Early data management initiatives will be somewhat of a learning process. It is best to make mistakes in these projects and then apply the learnings in customer-facing applications later. As discussed, consumer trust is critical in the telecom sector, and telcos do not want new data and AI initiatives to impact customer sentiment negatively. Test internally first, then move on to customer-facing use cases when ready.

Seek Trusted External Expertise

Though the long-term goal is a talented in-house team that can manage data governance and product development, many telcos will rely on external expertise to deliver change in the short term. These partnerships must be with specialist consultants with a proven track record of delivering successful data-related initiatives. They can also play a valuable role in helping shape and create educational initiatives to improve data literacy and participate in extensive knowledge sharing.

In the long run, investing in internal talent is essential. While telcos employ exceptional network and product professionals, they often lack data science and data management expertise. Bringing in individuals or upskilling current employees will lay the groundwork for successful data projects further down the line.

Ingrain Compliance into All Processes

In recent years, regulation and compliance have been core issues for all organizations managing data for commercial purposes. In Europe, GDPR imposed new requirements and profoundly impacted the way telcos leverage data, forcing companies to adapt and accommodate new tools, techniques and processes. With widespread AI adoption, new regulatory frameworks and regimes are on the horizon.

Scheduled for 2026, the **EU's AI Act** will mirror the effect of GDPR and legislate to control the use and implementation of AI and associated data. For telcos, the constantly evolving regulatory environment will pose compliance challenges.

While AI is commonplace throughout the industry, new GenAI applications will only increase telcos' exposure to regulatory risk. Though the technology is advancing rapidly — and legislators are struggling to keep pace — telcos need to factor compliance into all aspects of data management and governance to ensure they do not fall foul of future regulatory developments. As such, organizations must ensure they include data protection officers and compliance specialists in every aspect of development. Product managers should collaborate closely with these experts, building compliance into the development process and ensuring it covers a product's entire lifecycle.

Of course, compliance also depends on a company-wide culture that foregrounds responsible data use and emphasizes cross-functional project ownership. Setting clear boundaries to protect customer data and ensuring adherence to net neutrality regulations are also vital.

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Data is the Cornerstone of Contemporary Telecom Services

Strong data management and governance are the foundations on which telcos will build their data-driven future. They provide the means and mechanisms for streamlining internal processes, improving network performance, understanding customers better and delivering targeted services. Accurate, integrated data is also a prerequisite for the game-changing AI technologies that will fuel future growth.

This journey begins with defining a clear data vision, establishing strong data ownership and governance frameworks and consolidating data from disparate sources. Understandably wary of eroding consumer trust, telcos must prioritize internal use cases — creating a safer space to test and refine the processes and strategies that will facilitate the transition to data-centricity. Telcos must also recognize that maximizing data usage is both a technological and organizational project that depends on new technical solutions and changes in culture.

Developing data management frameworks, consolidating data from multiple pipelines and extracting valuable insights from that data will require specialist expertise. While telcos can source that expertise from consultants in the immediate future, investment in internal talent is also necessary over the long run.

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