tm**forum**

Data orchestration
The key to becoming a data-native organization

Author: Mark Newman, Chief Analyst
Editor: Dawn Bushaus, Managing Editor

teradata.

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Report Author:
Mark Newman
Chief Analyst
mnewman@tmforum.org

Report Editor:
Dawn Bushaus
Managing Editor
dbushaus@tmforum.org

Senior Analyst:
Tim McElligott
tmcelligott@tmforum.org

Editor, Digital Content:
Arti Mehta
amehta@tmforum.org

Customer Success & Operations Manager:
Ali Groves
agroves@tmforum.org

Commercial Manager, Research & Media:
Tim Edwards
tedwards@tmforum.org

Global Account Director:
Carine Vandevelde
cvandevelde@tmforum.org

Digital Marketing Manager:
Anna Kurmanbaeva
akurmanbaeva@tmforum.org

Data orchestration:
The key to becoming a data native organization

We hope you enjoy the report and, most importantly, will find ways to use the ideas, concepts and recommendations detailed within. You can send your feedback to the editorial team at TM Forum via editor@tmforum.org

The big picture

In December 2019, we published a report called ***How to leverage data across the entire organization***, which explored how communications service providers (CSPs) are collecting, storing and using data. In this report we revisit data analytics but in a broader context. Rather than focusing specifically on the challenges CSPs are facing, we assess the business implications of failing to use data insights to build a better customer experience. We also explore why the telecommunications industry has been slow to draw a correlation between providing better customer experience and improving financial results for shareholders.

As part of our research we interviewed C-level executives and senior VPs from CSPs in multiple regions of the world. They are executives who passionately believe in the power of data insights to unlock hidden value in their businesses, but they expressed disappointment and frustration in the slow, stuttering progress their companies are making.

Some blamed this on the failure to make data a strategic priority. "On a board level they talk about [data] because they know they have to talk about it…but when it comes to commitment they are sadly lacking," says the CTO of a mid-sized European operator. Others pointed at poor technology or vendor choices.

Whatever the reason for previous mistakes or lack of prioritization, the bigger question is: How can CSPs make up for lost time when they've already been on multi-year journeys to deliver better data insights? Making data a board-level priority by joining the dots between insights, customer experience and the profitability of the business is essential. But this is just the start.

Managing silos
Like most large organizations, CSPs have operational silos with their own systems, technologies and processes, and within each

of these are additional silos. In customer experience, for example, CSPs are adding digital touchpoints such as mobile apps and social media apps to legacy offline channels. Plus, operators are developing new lines of business such as TV and video for consumers, while on the enterprise side they are expanding into new verticals, adopting new business models such as platforms and seeking to exploit the potential IoT.

The challenge of creating a "single source of truth" for all this data becomes ever more difficult. The sheer volume of data points that need to be collected is becoming unmanageable with centralized systems. Operators need to shift their data into the cloud and automate the processes that convert raw data into data insights.

Doing this involves using platforms to collect, configure, coordinate and manage silos of data across the organization. This approach, which is known as data orchestration, is already used by digital native companies like Amazon and is something that Tier 1 CSPs are beginning to adopt.

However, the success of data orchestration is not guaranteed unless there is a willingness and a commitment across the business to put in place the right governance structures. Data orchestration needs support from the very top of the organization and a recognition that a top-down, holistic approach – rather than one driven by individual use cases – will ultimately deliver greater value.

Read this report to understand:

- Why CSPs' data strategies are failing
- How Amazon links customer experience to financial performance
- Why a digital experience is necessary but also challenging

- Where to look for the right skills
- How Vodafone is quantifying the business impact of better customer experience
- What data orchestration is and why it's important
- Why it's important to have a board level champion for a data strategy
- How Reliance Jio, Celcom Axiata Berhad and PCCW are leveraging data
- How The TM Forum Digital Maturity Model can help

" The challenge of creating a 'single source of truth' for all this data becomes ever more difficult. The sheer volume of data points that need to be collected is becoming unmanageable with centralized systems. Operators need to shift their data into the cloud and automate the processes that convert raw data into data insights. "

Section 1

Why are telcos' data strategies failing?

When we talk to CIOs, chief digital officers or other transformation leaders within communications service providers (CSPs) as part of our research, we often ask them where they think the telecoms industry is today, on a scale of one to 10, in its ability to leverage data. The answer is usually somewhere between three and five.
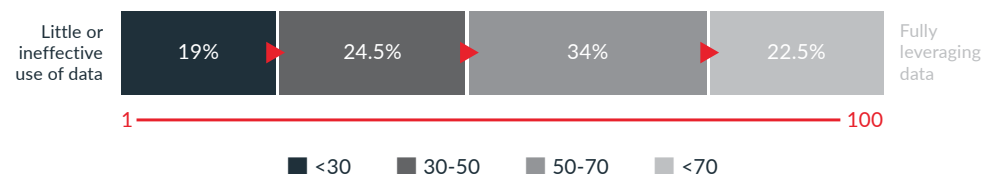
As part of a survey for our How to leverage data across the entire organization report, we asked a similar question about how effectively CSPs are leveraging data, but we used a scale of one to 100. The average was 53, with 20% of respondents rating effectiveness below 30.

But when it comes to topics such as data maturity, it can be dangerous to make the assumption that the opinion of one – or even a handful of respondents – is representative of the entire organization. Indeed, perceptions about the usefulness and potential of data vary hugely within the same CSP organization.

Natalia Macpherson, Business Partner at Teradata, the sponsor of this report, reckons that data occupies a very different place in the DNA of a digital native company compared with a telco.

"One fundamental difference we see between telco and digital native companies is the way they view data," she explains. "Digital natives treat data as an asset that leads to growth, which in turn leads to different operating models and decision-making processes. Technology players see data as the core of operations. In this kind of organization, everyone knows the value data brings, has direct access to data and has been trained on how to use data for commercial advantage."

How effectively are CSPs using data?

Little or ineffective use of data	19%	24.5%	34%	22.5%	Fully leveraging data

1 ———————————————————————— 100

■ <30   ■ 30-50   ■ 50-70   ■ <70

TM Forum, 2020

It's about the customer

Many lists circulating on the internet highlight Amazon CEO Jeff Bezos' best quotes. On all the lists, the key messages and central themes of the quotes are the same: Customer experience is the key driver for the business. Indeed, Amazon's focus on the customer is legendary.
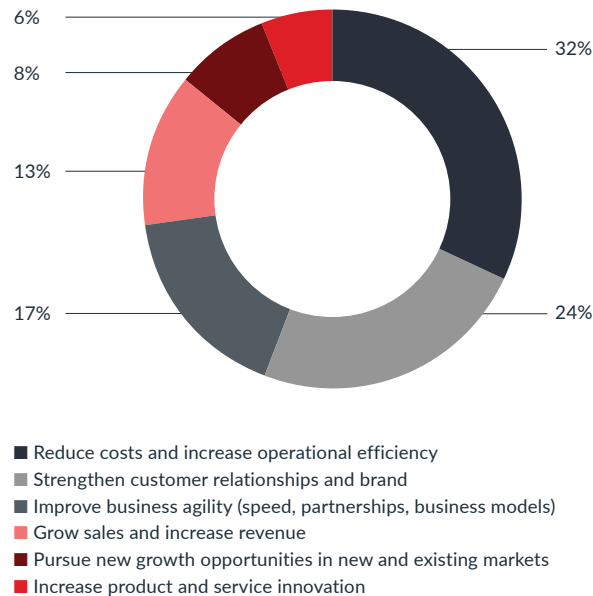
Perhaps the most relevant quote when contrasting Amazon's approach with that of telecoms operators is one about the benefits of focusing on the customer rather than on competitors.

"If you're competitor-focused, you have to wait until there is a competitor doing something. Being customer-focused allows you to be more pioneering."

Most CSPs would dispute any claim that they are not customer focused, although they likely would concede that their focus is not as great as Amazon's. We have been conducting *Digital Transformation Tracker* surveys annually since 2017, and all have found that building a stronger customer experience is the main driver of digital transformation.

But CSPs do not seem to have the conviction that if you look after customer experience, the business will look after itself. In another survey for a recent report called *Future customer experience: From digital to omnichannel*, we asked CSPs to rate the most significant factor driving their customer experience programs. The most popular answer was reducing costs and operational efficiency, chosen by a third of respondents, whereas strengthening relationships and brand came in second with only a quarter choosing it as most important.

Biggest driver of customer experience among CSPs

- ■ Reduce costs and increase operational efficiency
- ■ Strengthen customer relationships and brand
- ■ Improve business agility (speed, partnerships, business models)
- ■ Grow sales and increase revenue
- ■ Pursue new growth opportunities in new and existing markets
- ■ Increase product and service innovation

TM Forum, 2020

The focus on strengthening relationships and brand might be stronger if CSPs could demonstrate that better customer experience impacts the profitability of the business by generating more revenue. While CSPs can clearly measure cost efficiencies in their customer experience programs – for example, by migrating customer relationships to digital channels and reducing call center costs – they struggle to draw a line connecting better customer experience with higher revenues.

Vodafone UK is an exception. The company implemented a digital experience layer which has led not only to a 13-point increase in Net Promoter Score (NPS), but also to measurable improvement in terms of subscriber growth and increased revenue. We'll look at the company's success more closely in the next section ().

Multi-channel risk

Increasingly, subscribers are comparing the digital experiences provided by telcos like Vodafone UK to those of digital natives like Amazon and Apple, who provide such good digital tools and capabilities that customers very rarely need to contact a support line. Consumers have grown from the outset in a digital relationship with these companies, and the assumption always has been that there is a digital answer to all questions.

It's different with telcos because the relationship with customers did not start out as digital. CSPs' success delivering digital experiences has been limited, and attempts often feel dull and impersonal.

CSPs want to move the majority of interactions with customers online, but they do not plan to shut down other channels. Telcos serve the whole population, and parts of society lack the digital skills and access required to take their relationships online. An increase in digital interactions may give operators the opportunity to shut some shops and reduce call center staff, but most CSPs are absolutely committed to remaining multi-channel.

If CSPs don't commit to becoming fully digital, however, it's unclear whether they can ever get close to matching the experience provided by digital natives. If a customer's touchpoints are evenly divided between physical and digital channels, is it realistic for a telco to integrate all the customer data that is required to create compelling experiences?
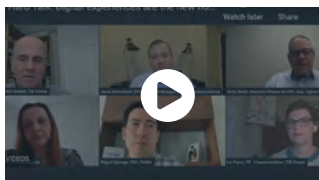
Going digital is difficult

CSPs often underestimate how difficult it is to build strong digital relationships. Most have launched mobile apps, and many have introduced chatbots. But the experience of using them often is not rewarding enough in terms of problem resolution or personalization to make customers comfortable with transitioning to a near or fully digital experience.

Juha Korhonnen, who has served as Head of Innovation and Digital Services at Zain since 2014, believes that that CSPs generally have taken the wrong approach to leveraging data. Many have recruited large, traditional vendors to generate insights from data but then have failed to give them access to customers or their data, often because of concerns around privacy or a reluctance to use tools in the public cloud.
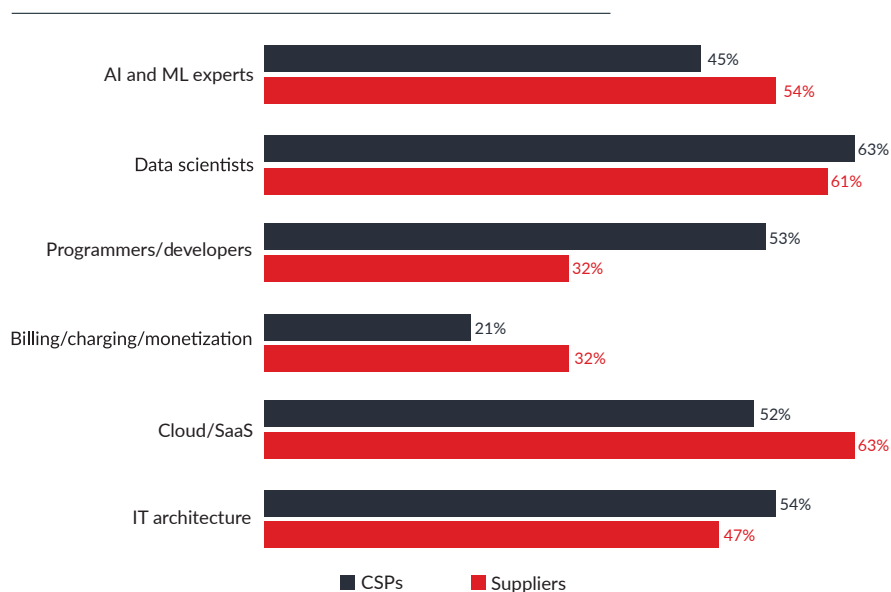
Korhonnen now works on a day-to-day basis in a new, digital-only brand called "Ruby", which Zain launched in 2019. The digital telco built its business support system stack from scratch, and Korhonnen stresses the importance of having "a new team with new thinking where 70% to 80% of the team are non-telco people."

Miguel Quiroga, CEO of Verizon's digital brand Visible, also believes that operators underestimate how challenging it is to build compelling digital experiences. Speaking as a panelist on a recent TM Forum Hard Talk webcast, Digital experiences are the new norm: Can telcos deliver?,

Watch the Hard Talk discussion on demand:

Which IT Skills do CSPs need?

	CSPs	Suppliers
AI and ML experts	45%	54%
Data scientists	63%	61%
Programmers/developers	53%	32%
Billing/charging/monetization	21%	32%
Cloud/SaaS	52%	63%
IT architecture	54%	47%

TM Forum, 2020

Quiroga talked at length about the challenge of getting to know your customers, predict their behavior and build relationships that work for them.

Finding talent
Without the right skills, CSPs will struggle to execute on their data strategies. Our Digital Transformation Tracker 4 report found that CSPs and their suppliers recognize that data scientists are the most important IT skills that operators need to recruit. However, even when CSPs do have strong data science capabilities, it does not necessarily mean that they are being used in the right way.

We spoke to several CSPs for that report who said that their data science teams were spending much of their time simply making data usable (for example, addressing issues around "dirty" data or formatting) rather than actually spending time working with business stakeholders to understand their objectives and to determine how data can be used to meet them.

Are telcos investing enough?
Research firm IDC forecasts that revenue from data and analytics solutions will reach $189 billion, experiencing double-digit growth between now and 2023. The four sectors expected to spend the most are banking ($26 billion), discreet manufacturing ($21 billion), professional services ($16 billion), process manufacturing ($16 billion) and government ($13 billion).

It is widely recognized that banks have moved well ahead of CSPs both in terms of how much they invest in data and the transition to digital experiences. The fact that telecoms does not figure in IDC's analysis of investment in data analytics would appear to confirm that telcos are not prioritizing data analytics. In the next sections, we'll look at ways for CSPs to change this.

Read these reports to learn more about the relationship between data and customer experience:

Section 2

Quantifying the business impact of improving customer experience

Many research firms have attempted to quantify the business impact of improving customer experience, but in most cases the numbers are based on theoretical models. Finding real examples of companies that been successful in translating improvements in Net Promoter Score (NPS) into increased revenue is difficult, although not impossible.

At the end of last year Forrester produced a piece of research entitled *How customer experience drives business growth.* It assessed 14 industries, each with its own model based on the "business impact of each customer's (dis)loyalty." In the case of automotive manufacturers, for example, Forrester estimated that improving customer experience by one point could translate into more than $1 billion in additional revenue.

Research from Gartner has found that companies soon will be valued by their information portfolios. One of its studies showed how companies demonstrating "information-savvy" behavior like hiring a chief data officer, forming data science teams and setting up data governance can command market-to-book ratios well above the market average.

"Anyone properly valuing a business in today's increasingly digital world must make note of its data and analytics capabilities, including the volume, variety and quality of its information assets," Douglas Laney, VP and Distinguished Analyst, Gartner, said in a statement about the research.

The reality for most communications service providers (CSPs), however, is that their boards – while fully embracing the drive for better customer experience – are unable to trace a direct impact on overall profitability. And when it comes to their use of data, most operators are only paying lip-service to leveraging data without really understanding what is needed or indeed possible.

We interviewed the CTO of a European telco who has held leadership roles in several operating companies about commitment at the board level to leveraging data as an asset "Most executives talk about how important data is, but when it comes to real commitment they are often lacking," he says. "It took me five years to get the ball rolling in my current role – and that is only for the use of data in the network."

Real evidence

Vodafone UK is an exception and the company's success is precisely the type of case study that the telecoms industry needs to drive greater commitment to and investment in data-driven customer experience. Vodafone UK recorded quarter-on-quarter increases in revenue after leveraging **TM Forum Open APIs** to implement a new microservices-based digital experience layer. In 2018, Vodafone UK managed to improve its consumer Net Promotor Score (NPS) by 13 points from +9 to +22, which at the time was an all-time high. It has since risen to +33 ().

Vodafone UK's NPS improvement resulted from implementation of the digital experience layer, which helps the operator's IT group roll out more than 40 on-demand production releases a day. The team has achieved zero downtime while deploying microservices into production, and total cost of ownership has been reduced as a result of reuse, adoption of cloud applications and an automated continuous integration and delivery pipeline.
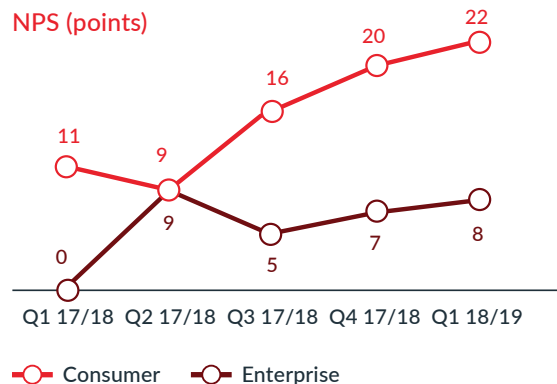
Learn more about Vodafone's digital experience layer by reading this case study on TM Forum Inform:

Vodafone increases consumer NPS by +13

Customer Experience

NPS (points)

Consumer: 11, 9, 16, 20, 22
Enterprise: 0, 9, 5, 7, 8

Q1 17/18   Q2 17/18   Q3 17/18   Q4 17/18   Q1 18/19

○— Consumer   ○— Enterprise

TM Forum, 2020 (source: Vodafone)

Optimization of non-production environments has delivered an additional cost savings of £500,000 ($621,000) per year, and the Vodafone UK digital experience layer has become the one Vodafone now uses across its entire group of operating companies.

Vodafone UK also has seen measurable improvement in terms of subscriber growth and increased revenue. In the second half of 2019, its customer base started growing again after stagnating during 2017 and 2018 (as of December 2019, the company had 19.4 million subscribers). Revenues have also started to grow again, but it is more difficult to see a clear trend in churn rates (see graphic opposite). This would be the biggest proof point for justifying greater investment in improving customer experience.

Reducing churn
Reduction in churn is another way of demonstrating the benefits of improving customer experience. Hong Kong-

based PCCW has seen a reduction in churn from 1.3% per month to 1.1% in the last few years, although its commitment to data goes back five or six years.

Group CTO Paul Berriman says PCCW's investment in data has always been driven by a desire to improve customer experience. One of the company's initiatives has been to partner with an analytics vendor to create a "Customer Happiness Index", which measures customer satisfaction by analyzing several types of data including customer, network, social media and call-center data. NPS only measures customer data.

In the next section, we'll look at how data orchestration can improve customer experience.

Vodafone UK mobile service revenue and mobile churn
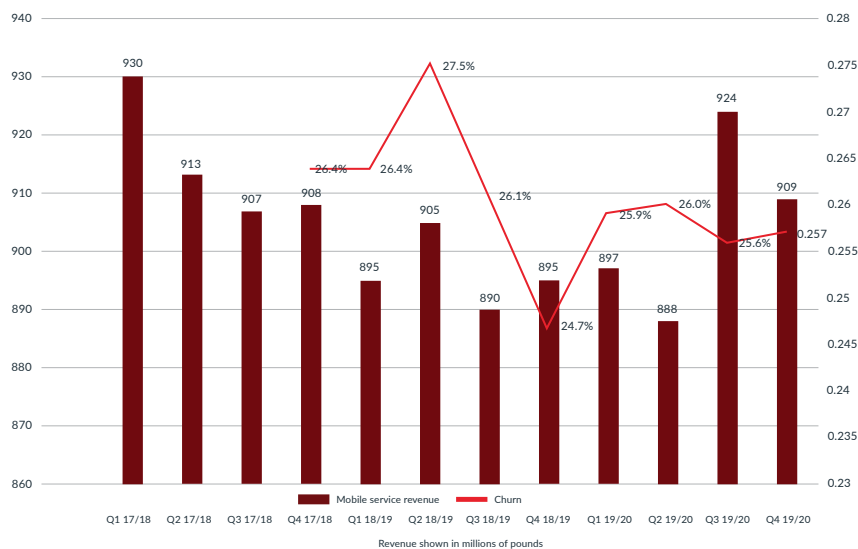
TM Forum, 2020 (source: Vodafone)

Section 3

Using data orchestration to break down silos

The term "data orchestration" may be new to people working in telecoms organizations, but its purpose is to solve a problem that is all too familiar: overcoming fragmentation of approaches to leveraging data in different parts of the organization. Indeed, silos of data and a wide variety of solutions for analyzing data make it difficult if not impossible for communications service providers (CSPs) to turn it into actionable intelligence.

Companies increasingly are struggling to create a "single source of truth" where different types of data (for example, customer, network and social media) can be centralized, managed by data experts and distributed wherever it needs to be used at any given point in time. This is because as sources of data multiply and the volume of data increases, managing it centrally becomes increasingly difficult. Over time, and as CSPs come to terms with the millions of new (IoT) devices that are being connected to their networks, the problem is only going to get worse.

In our How to leverage data across the entire organization report, we made the case for building network data into the overall customer experience. We also explored other data that could bring real benefits to parts of the business outside their specific silos. For example, better access to data from the network can help with quarterly CapEx planning and budgeting.

This is difficult to achieve, however. Network data is used to optimize the performance and efficiency of the network (for example, in predictive maintenance), but significant challenges exist in integrating this with data from customer relationship management (CRM) systems because it is often incomplete, in an incompatible format or difficult to access. Even with CRM data, many CSPs struggle to bring together online and offline channels and integrate this with social media data.

Analytics software provider Teradata defines data orchestration as "the automation of data-driven processes and models from end to end including the preparation and management of the data, making decisions based on the data and taking actions based on these decisions."

In short, data orchestration helps companies collect, configure, coordinate and manage silos of data by moving them to the cloud.

A leader to champion the cause
To implement data orchestration, it must be a priority for the business. "You definitely need a champion at board level," says the CTO of a mid-sized European operator. Such a champion could be a CTIO or a CIO, but the most effective advocate is often a chief digital, chief data or chief transformation officer.

Development of these roles across CSPs is patchy, however, and in many cases they are figureheads who lack the power to implement solutions that do not demonstrate short-term benefits to stakeholders. There is also a risk that the chief data officer may seek to build another silo or power-base rather than making their influence felt horizontally across the entire business.

Who is leading CSPs' transformation programs?

14%
1%
2%
11%
13%
11%
40%
8%

- CEO
- Chief marketing officer
- Chief information officer
- Chief technology information officer
- Chief digital officer
- Chief operating officer
- Chief customer officer
- Other
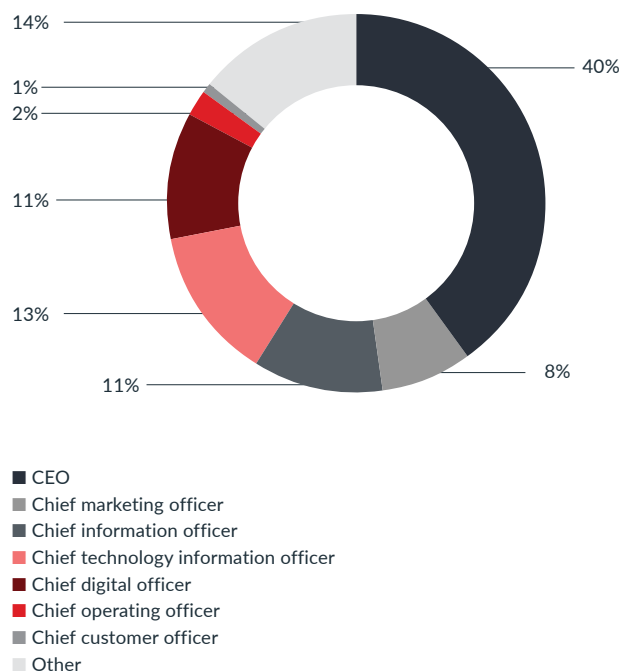
TM Forum, 2020

Reliance Jio parlays data into partnerships

Few telecoms operators are as committed to leveraging data as India's Reliance Jio. Indeed, Mukesh Ambani, Chairman and Managing Director of parent company Reliance Industries calls data "the new wealth".

Jio started out more than three years ago with a commitment to get all its data in one place, set up the right digital tools to ingest and manage it, and build a platform to write applications on top. While the strategy for managing data in most CSPs sits with the IT team, at Reliance Jio it is a business strategy. Raghu Velega, Jio's VP of Big Data Analytics explains that the company employs 150 data engineers whose job it is to create clean data and more than 100 data scientists who take the cleansed data and build value on the top.

"It has become very easy to correlate the difference sources of data," he says. "We process the data and store it based on a queryable format. We are in the process of creating a map of all the data that we have, which will be put into the hands of the business. It will show not just the type of data but also the quality of data, its correctness and completeness."

Reliance Jio's focus on data management likely made it an attractive investment target for Facebook. In April, the social media giant took a 10% stake in Jio. It is difficult to imagine Facebook making such an investment if it did not have confidence in being able to integrate the data from its platforms including WhatsApp and Instagram with Jio's data.

In our *Digital Transformation Tracker 2* survey conducted in 2018, we asked CSP respondents who is responsible for leading transformation within their companies, and only about 10% named a chief digital officer as either leader or co-leader.

Eliminate use cases

As well as identifying a "neutral" person to evangelize data orchestration and build a business case for its adoption, CSPs should do away with a "use case" approach to data, according to management consulting firm Bain & Company, because this leads to silos. An example of a use case-based approach might be using data insights to improve a single CEM channel such as chatbots. Bain cautions that analytics solutions operating in silos result in the following challenges:

Proprietary data assets that are not shared across teams – an individual team may not be able to identify or understand which insights may be useful to another team.

Distributed and unshared knowledge – as telecoms operators endeavor to bridge the gap between technology-centric and business-centric decision-making in their organizations, access to better information about all aspects of the business is essential.

Inefficient architecture and systems – solutions developed for single use cases are unlikely to take account of the benefits from deploying technologies and processes that can support other use cases. This leads to a high cost, both financially and when it comes to future-proofing (for example, cloud).

Inconsistent databases and analyses due to differing definitions for data objects – various departments within an organization have their own technology partners and systems which are likely to use proprietary approaches. This makes it difficult to port data across the organization. Instead, Bain recommends "a capability-driven approach with a focus on building capabilities that support current and future use cases equally well on a common platform." Such an approach requires common data and tools.

Measure maturity

The TM Forum Digital Maturity Model (DMM) can help CSPs develop a capability-driven approach. The DMM is a survey-based tool specific to the telecommunications industry that lets organizations describe their level of maturity and digital capabilities, set target maturity levels and benchmark against peers. It is split into six categories, or dimensions, representing critical areas of focus for the business.

Each dimension contains sub-dimensions, or business areas, where CSPs can drill down to assess digital maturity. The idea is for operators to score themselves for each of these dimensions and sub-dimensions and then based on their strategy decide how, when and where to deploy or redeploy budget and resources.

The Data dimension includes Data Governance, Data Engineering and Data Value Realization as sub-dimensions. Celcom Axiata Berhad used a precursor to the DMM Data dimension called the Big Data Analytics Maturity Model to measure progress in rolling out a data governance program, and the results have been encouraging.

The company increased its data governance score in the big data assessment from 30% in January 2019 to 95% in November 2019 and established common strategic frameworks and standard operational workstreams. In addition, the company trained more than 50 data governance champions from all parts of the organization.

Several factors contributed to the dramatic increase in Celcom's data governance score:

■ Although data governance had existed in pockets across the organization, new frameworks and work streams set standards and company-wide expectations.
■ Participation within eight Scrum teams indirectly trained participating employees to become data champions in their respective departments.
■ By taking better care of data, Celcom was positioned to boost confidence amongst customers and internal teams, driving increased value into the business.

"Data really is at the center of the company now," says Sunny Nirala, who was Tribe Master and led Celcom's Cross Functional Team on Enterprise Data Governance. "It's quite humbling to see something start from zero to where now hundreds of people rely on it."

In the next section, we offer some guidance to help CSPs get started on the road to becoming data native companies.

Read more about Celcom's data transformation:

" By taking better care of data, Celcom was positioned to boost confidence amongst customers and internal teams, driving increased value into the business. **"**

Section 4

Make it happen – Strategies for becoming a data native company

Data orchestration can help communications service providers (CSPs) shift data into the cloud and automate processes to convert raw data into actionable insights. Companies like Amazon use this approach to help make the connection between data, customer experience and the financial bottom line. Here are some steps CSPs can take to emulate their success.

Make data a boardroom priority

Many telecoms operators pay lip service to the idea that data insights are critical to the success of the business. In practice, however, data analytics often are the responsibility of the IT and operations team, which lacks the budget and empowerment to make using analytics a business imperative. CSPs should make data a priority by appointing a C-level executive to head the strategy, but they should be careful not to create a new data silo. The role could sit with the CTO, CTIO, CIO or a specially created chief data or digital officer, but in any case they must have access to adequate resources and they should implement a data governance program that covers the entire organization.

Assess digital maturity

How much should a CSP invest in data analytics? They spend less on analytics than banks, but should they? And if they are going to spend more, how will that impact spending on other projects and requirements? **The TM Forum Digital Maturity Model** is an online tool to help companies assess digital maturity and navigate transformation. Organizations adopting the tool use it across the company to understand where their own staff believe the business is mature or immature. To find out how your company can use the DMM, please contact **Aaron Boasman-Patel.**

Explore data orchestration

Data analytics might seem like a relatively new area of investment for CSPs, but it already has legacy. Most Tier 1 operators have made significant investments in centralized (cloud) and decentralized (on-premise) systems and capabilities. This legacy complicates adoption of data orchestration. CSPs are not likely to have enough knowledge about data orchestration to put together a useful request for proposal or quotation, so they should instead engage with potential partners (on a commercial basis) to assess what can be achieved at different timescales and levels of investment.

Measure the impact of customer experience

Customer experience is a priority for most telcos, but most don't have a clear picture of how improving it translates into higher revenues and profits. It's fair to assume that better customer experience results in more loyal customers, but CSPs need tools, metrics and key performance indicators to understand the relationship. Many operators don't aim higher than delivering "good enough" customer experience while cutting costs through reducing call center staff and retail footprint. There is little vision or understanding of what providing excellent customer experience could do for the business.

Invest in capabilities

In a traditional approach to investing in data analytics, CSPs identify a specific use case and then the relevant department or line of business works with the IT group to address the challenge or opportunity. This approach will not result in a future-proof data analytics strategy. Instead, operators need to invest in analytics capabilities that can enable multiple use cases. This includes creating centralized teams (across business and IT) in areas such as architecture, governance, tooling and adopting a 360-degree view of the customer.

" CSPs need to invest in analytics capabilities that can enable multiple use cases. This includes creating centralized teams and adopting a 360-degree view of the customer. "

From Telecommunications to Technology Leader: How big is the data gap?

teradata.

Welcome to the Age of Data

The telecommunications industry is almost unrecognisable compared to ten years ago. While the central offerings of the average telco have moved far beyond providing customers with standard voice communication lines, the march towards a communications future led by data isn't without its delays and stumbling blocks.

Despite significant effort to transform, the telco industry is still lagging behind main technology players. It's ironic, as telcos capture more customer specific data on an annual basis than Google and Facebook, yet still enjoy only a fraction of their market capitalisation. One of the reasons for this lag is the industry's underestimation of the value of data it captures from customers, and the value this data can bring.

One fundamental difference we see between telco and digital native companies is the way they view data. Digital natives treat data as an asset that leads to growth, which in turn leads to different operating models and decision-making processes.

Technology players sees data as the core of operations. In this kind of organisation, everyone knows the value data brings, has direct access to data, and has been trained on how to use data for commercial advantage.

At Teradata, we're intrinsically aware of that colossal shift many companies in transformation have to make. Not only did we take that data journey with the largest technology players – who remain one our biggest customers to this day – but we helped them shape themselves into becoming technology companies that lead with data. We understood early that customer-facing products and services involving technology were shifting their focus to immediacy and convenience. A highly customer-focused, omnichannel, always-on delivery – whenever and wherever it's needed.

Data & Analytics Orchestration

At the backend, crunching all the data generated by your customers and employees, all day, every day, requires some serious technology. Some large enterprises process trillions of records per day, collected from many areas of the business. To make full use of all that data requires a dedicated data core, and an orchestration engine to connect all the dots to maximise insights from the data – **we call it data orchestration.**

What do we mean by Orchestration?

Data Orchestration is the automation of data driven processes from end to end.

This includes the preparation and management of the data, making decisions based on advanced analytics and taking actions based on those decisions. The process spans many systems, functions and varying types of enterprise-wide data. In the large complex enterprise with many legacy systems it is extremely hard to do.

Teradata's platform technology means that data management and analytics capabilities can be carried out at hyperscale. This unique combination of scale, speed, complexity, concurrency, integration and scope provides the enterprise with the advanced capabilities required to run millions of productionised models, on trillions of interactions, every second of every day – all at a granular customer, product and monetary level.

These interlinked analytics, running on tightly integrated data, ensure that business has a visibility across the entire operation, not just part of the business, processes are truly data-driven and demonstrate constant and consistent improvements in business outcomes.

From Telecommunications to Technology Leader: How big is the data gap?

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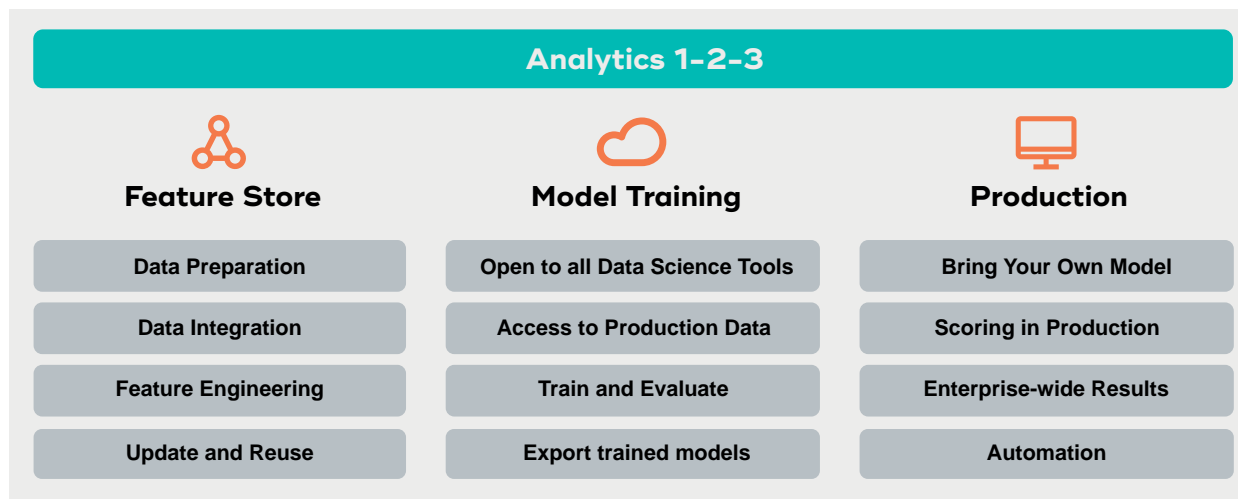
True orchestration only works end-to-end

Data-driven analytics functioning effectively and productively must be an end-to-end process across the business.

This means enterprise-ready solutions need that key ability to hyperscale to support the business models of the future – as volumes and complexity of data are only going to keep getting bigger.

Hyperscale businesses are built on the principal that data is the only corporate asset of significant enough value to change the valuation of a business, and this monetisation is the fundamental growth driver of enterprise in the 21st century.

Leveraging data as an asset is not easy, and many attempts fail when analytics move from the lab to production. But Teradata's Advanced Analytics capability has been designed specifically to take advantage of our robust underlying technology that can manage, prepare and execute analytics on an enterprise scale that has never been seen before.

This analytical orchestration capability delivers such a high degree of value that the data asset rapidly becomes more valuable than the business network itself, high street stores, or even an organisation's capital reserves.

Analytics 1–2–3		
Feature Store	**Model Training**	**Production**
Data Preparation	Open to all Data Science Tools	Bring Your Own Model
Data Integration	Access to Production Data	Scoring in Production
Feature Engineering	Train and Evaluate	Enterprise-wide Results
Update and Reuse	Export trained models	Automation

Orchestration at hyperscale makes data a primary asset across an organisation

Teradata's firm belief is that when harnessed, data is the most valuable corporate asset an organisation can own. Investment in this asset is now critical to a business's success and, as such, it's a topic for the CEO to understand, embrace and own.

It's also vital that all employees understand the importance and value of data for a business to become truly data-driven. Access to data should not be restricted to one or two relatively small functions - it should be shared and used across the enterprise, and extended to customer and supplier access where relevant.

Teradata technology is built specifically to support three simple premises:

- Store once, use many times – economies of scale and re-usability pay dividends
- Run millions of interlinked data models in production to gain improved insight and actions
- Take the analytics to the data - answer any question, any time, of any data

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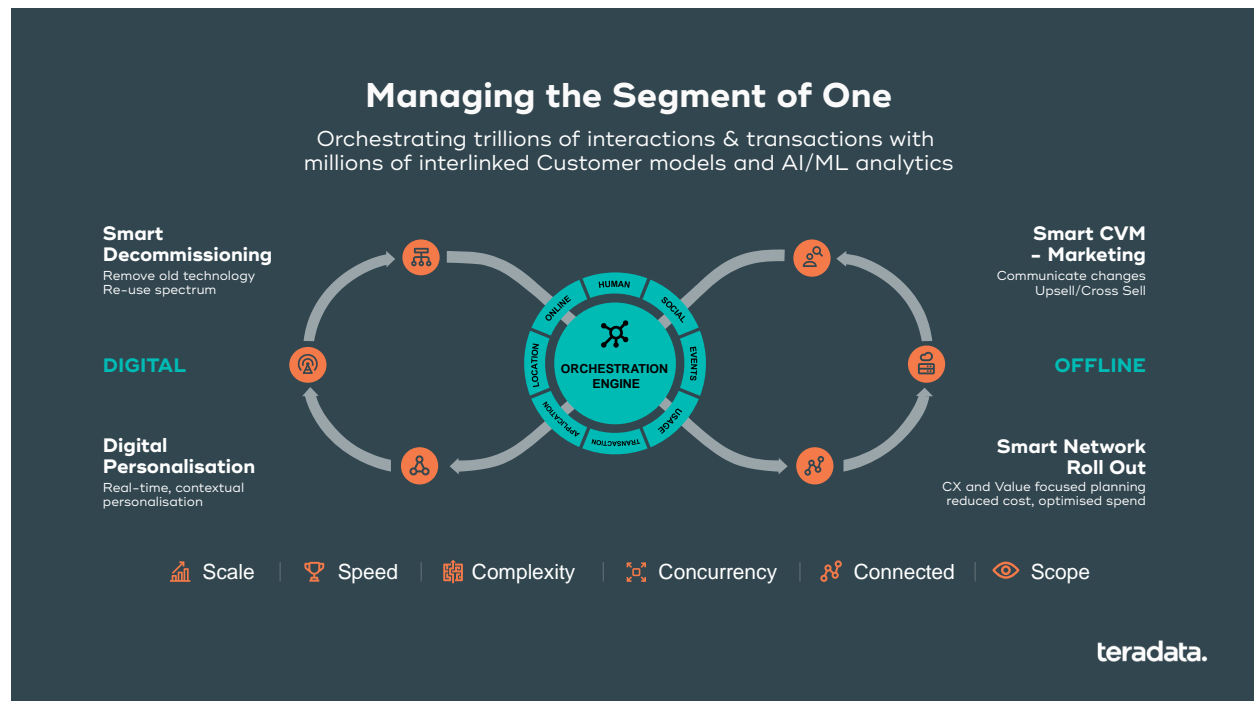
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The telco of the future will closely resemble a technology company

The immediate benefits of data-driven thinking for a telco and many and various. In an end-to-end solution, Teradata looks at trillions of data interactions across many millions of customer models. We think of it as a "segment of one" approach to data analytics, where all data across the organisation is rolled into a single 'infinity loop'. With this approach, integrated, operationalised analytics are ready to help roll out the next generation of fixed and mobile networks at a "segment of one" level, whilst dramatically improving customer experience and personalisation across all touch points and channels.

The outcome? High impact financial results and double digit NPS improvements. Incremental benefits can be harvested from the subsequent decommissioning of older network technologies and consolidation of data stores as they become redundant as a result of the centralised orchestration capability.

From telco to digital technology player

With Teradata, it really is all possible. We've been working with the largest organisations with the biggest data challenges for decades, and have created the data-led hearts those companies have needed to grow into trendsetters for the Age of Data we're now living in.

Managing the Segment of One
Orchestrating trillions of interactions & transactions with millions of interlinked Customer models and AI/ML analytics

Smart Decommissioning
Remove old technology
Re-use spectrum

DIGITAL

Digital Personalisation
Real-time, contextual personalisation

Smart CVM – Marketing
Communicate changes
Upsell/Cross Sell

OFFLINE

Smart Network Roll Out
CX and Value focused planning
reduced cost, optimised spend

ORCHESTRATION ENGINE — HUMAN, SOCIAL, EVENTS, USAGE, TRANSACTION, APPLICATION, LOCATION, ONLINE

Scale | Speed | Complexity | Concurrency | Connected | Scope

teradata.

As the telco industry seems to shrink by the year through mergers and acquisitions, we can see the time is right for every telco to start thinking like a digital technology player. It's a move that technology and infrastructure is ready for, which stands only to benefit communications providers with exciting new revenue streams and which, at a fundamental level, is everything the average, data-immersed customer now expects when they connect to a communications network.

Data is now an asset, and it's time to sweat that asset – at hyperscale.

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TM Forum Open Digital Framework

A blueprint for intelligent operations fit for the 5G era

The TM Forum Open Digital Framework provides a migration path from legacy IT systems and processes to modular, cloud native software orchestrated using AI. The framework comprises tools, code, knowledge and standards (machine-readable assets, not just documents). It is delivering business value for TM Forum members today, accelerating concept-to-cash, eliminating IT and network costs, and enhancing digital customer experience. Developed by TM Forum members through our Collaboration Community and Catalyst proofs of concept and building on TM Forum's established standards, the Open Digital Framework is being used by leading service providers and software companies worldwide.

Core elements of the Open Digital Framework
The framework comprises TM Forum's Open Digital Architecture (ODA), together with tools, models and data that guide the transformation to ODA from legacy IT systems and operations.
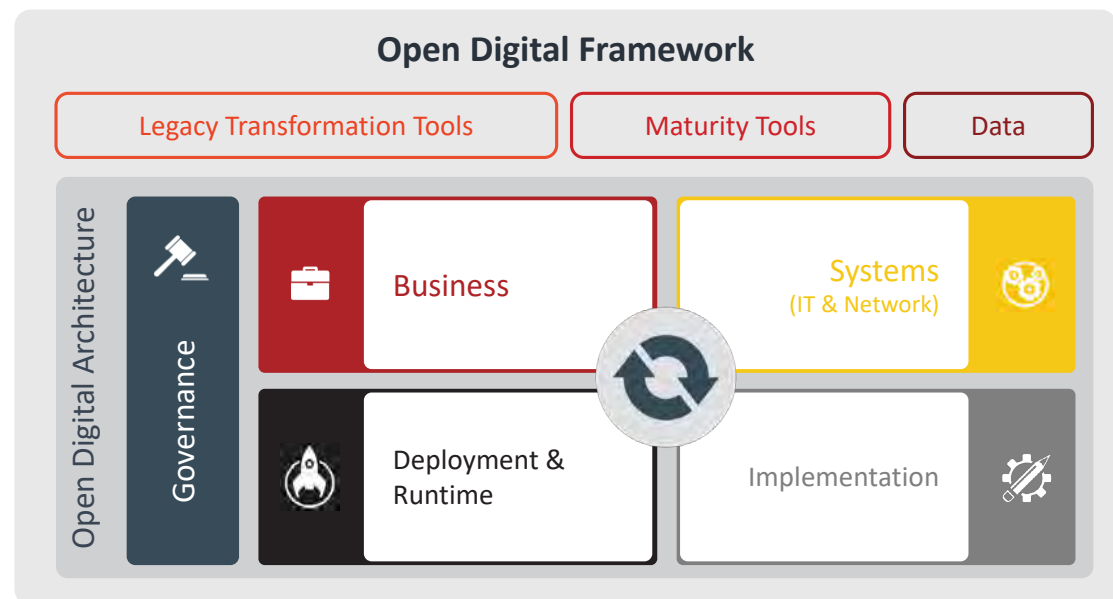
Open Digital Architecture
- Architecture framework, common language and design principles
- Open APIs exposing business services
- Standardized software components
- Reference implementation and test environment

Transformation tools
- Guides to navigate digital transformation
- Tools to support the migration from legacy architecture to ODA

Maturity tools & data
- Maturity models and readiness checks to baseline digital capabilities
- Data for benchmarking progress and training AI

Open Digital Framework

Legacy Transformation Tools	Maturity Tools	Data

Open Digital Architecture

Governance

Business

Systems (IT & Network)

Deployment & Runtime

Implementation

Goals of the Open Digital Framework
The Open Digital Framework aims to transform business agility (accelerating concept-to-cash from 18 months to 18 days), enable simpler IT solutions that are easier and cheaper to deploy, integrate and upgrade, and to establish a standardized software model and market which benefits all parties (service providers, vendors and systems integrators).

Learn more about collaboration
If you would like to learn more about the project or how to get involved in the TM Forum Collaboration Community, please contact George Glass.

TM Forum
Research Reports
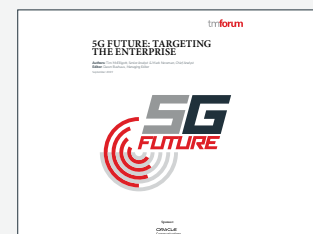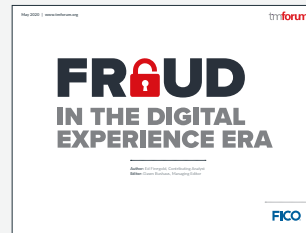
Meet the Research & Media team

Report Author:
Mark Newman
Chief Analyst
mnewman@tmforum.org

Report Editor:
Dawn Bushaus
Managing Editor
dbushaus@tmforum.org

Senior Analyst:
Tim McElligott
tmcelligott@tmforum.org

**Customer Success
& Operations Manager:**
Ali Groves
agroves@tmforum.org

Editor, Digital Content:
Arti Mehta
amehta@tmforum.or

Global Account Director:
Carine Vandevelde
cvandevelde@tmforum.org

**Commercial Manager,
Research & Media:**
Tim Edwards
tedwards@tmforum.org

Digital Marketing Manager:
Anna Kurmanbaeva
akurmanbaeva@tmforum.org

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For more information about TM Forum's Digital
Maturity Model, please contact **Aaron Boasman-Patel**