Transformation

STL PARTNERS

Executive Briefing

TELCO TO TECHCO: SIX TENETS FOR SUCCESS

An exploration of progress of telecommunications service providers within EMEA as they adopt techco practices.

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Foreword

This document has been prepared by independent consulting and research firm STL Partners and was commissioned by Red Hat.

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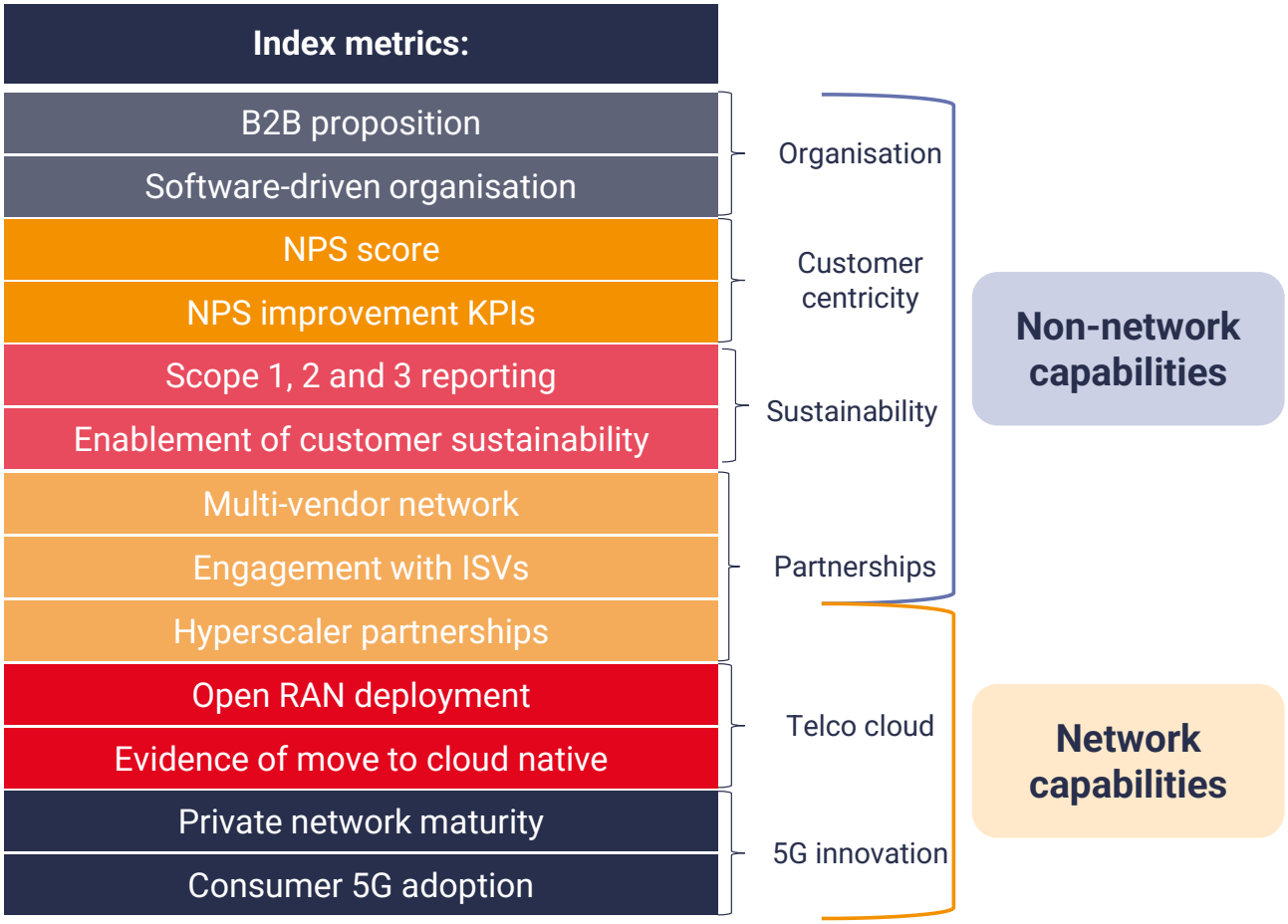
This report leverages findings from an extensive research programme conducted in EMEA, including interviews with eight different CSPs and a survey with 54 responses from CSPs across the region. The research explored the progress of telcos within EMEA as they adopt techco practices.

This was supplemented by a secondary research exercise to construct a transformation index featuring 33 telcos. Using publicly available information, we measured the progress of these telcos in key transformation capabilities across both network and non-network domains. See Figure 1.

Figure 1: Overview of our transformation index metrics



Source: STL Partners, 2023

This benchmarking exercise resulted in the classification of telcos into one of four categories (see Figure 2):

1. **Traditional telco:** Deploying connectivity is the main priority, with the network managed manually.

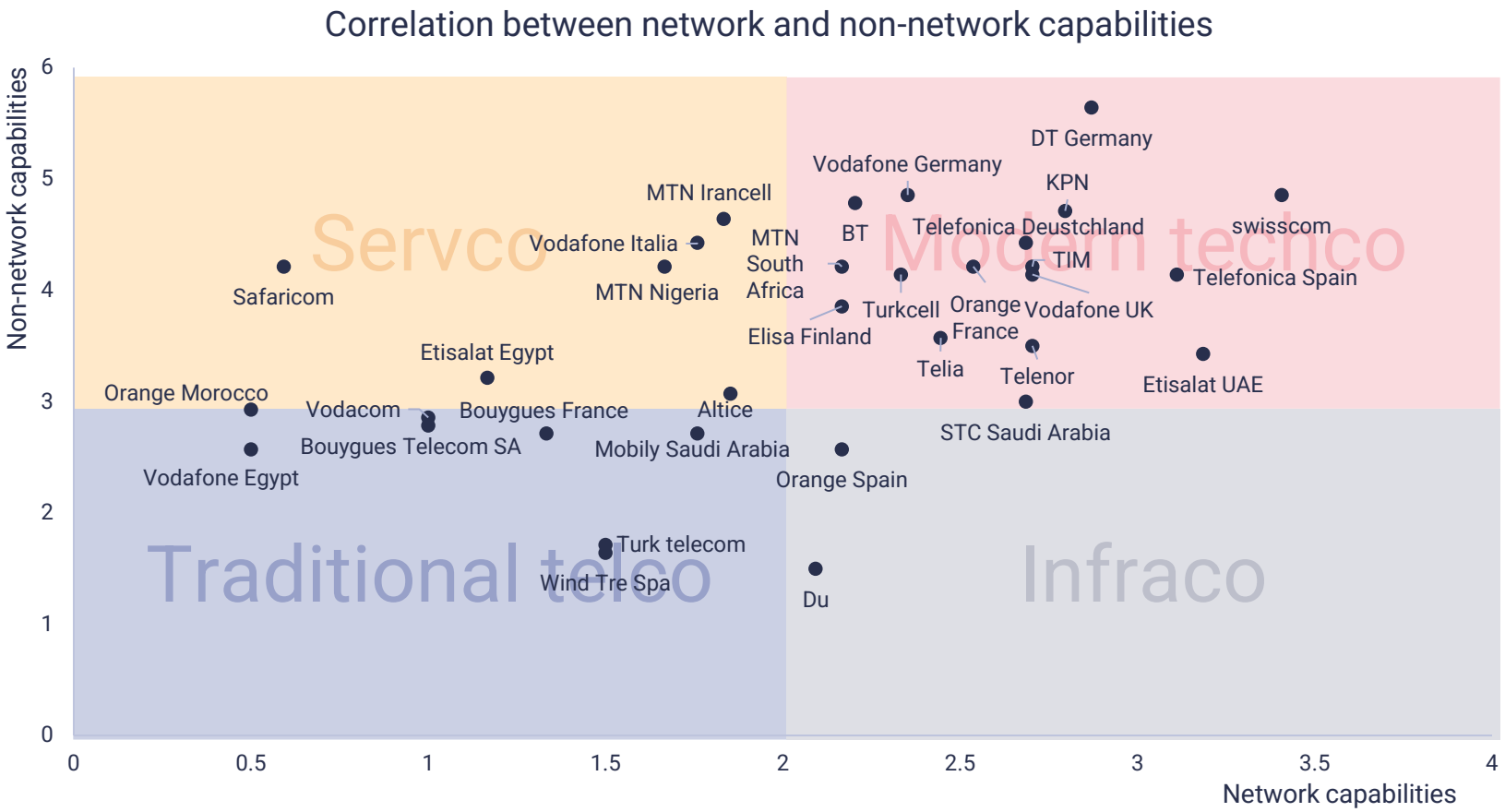
2. **Infraco:** Building optimised infrastructure and utilising automation throughout the physical and logical network is the priority.

3. **Servco:** Developing new services, based on B2B enterprise strategy and marketplace approaches.

4. **Techco:** Combining automated, cloud-native networking with next-generation services.

This report follows on from our previous report Transitioning to techco in APAC: Priorities for success (October 2022). The earlier report focused on the APAC region and leveraged slightly different transformation metrics. These new metrics better reflect the strategic priorities of telcos in 2023, with a greater focus on the customer (be it consumer or enterprise) and software skills and processes. If you would like to read the previous report, please use the link above. If you have questions on the evolution of these reports, do not hesitate to reach out.

Figure 2: Overall output from STL Partners Telco to Techco benchmarking index

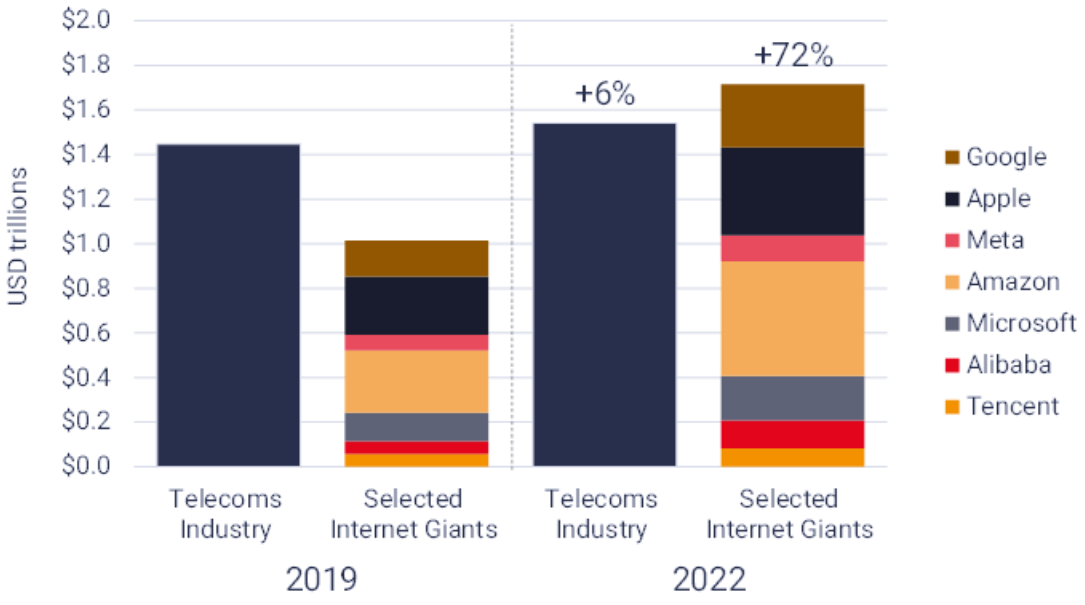


Source: STL Partners, "Telco to Techco benchmarking index", 2023

Executive Summary

For telcos that had grown accustomed to remarkable and consistent growth margins throughout the boom of network communications and the mobile industry, the current outlook of decreased profitability and intense competition from powerful new entrants offers grim reading. The old model does not work. Technology players are winning (see Figure 3).

Figure 3: Telco revenues are growing at a much slower rate compared to the global internet giants



Source: STL Partners

With their rapid deployment cycles, software skills and global scale, hyperscalers and other internet players have benefited from SaaS economics to become the global leaders in technology infrastructure. In a previous report focused on APAC, we considered how telcos could learn from these technology players to become the modern "techco"; a telco focused on technology. This techco model is defined by

- an intense focus on the customer (both consumer and enterprise);
- implementation of new software skills and the organisational structures which facilitates the deployment cycles necessary for CI/CD;
- open partnership models.

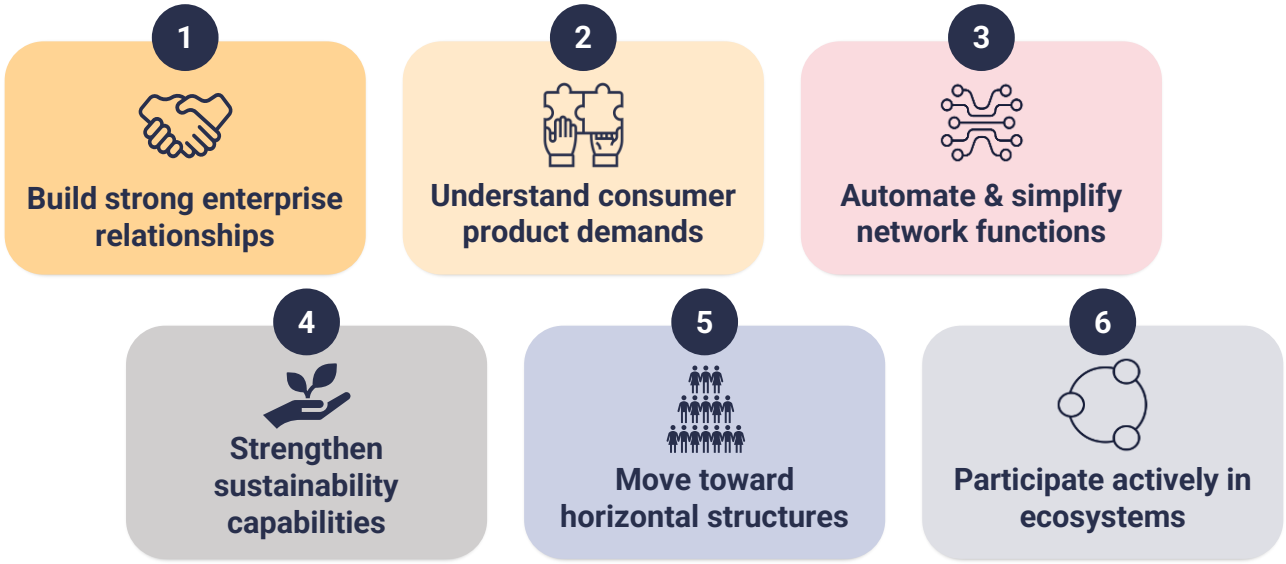
This research focused on telcos in Europe, the Middle East and Africa, including interviews with eight different CSPs and a survey with 54 responses from CSPs across these regions. This research was

supplemented by a transformation index of 33 EMEA telcos, analysing their individual progress across network and non-network domains. Figure 2 shows how the telcos perform, with their position suggesting an affiliation with a specific business model, as outlined in the Foreword.

Six tenets telcos must consider to pursue a techco transformation

Regardless of the final approach, our survey found that 93% of telcos are concerned with growing revenues over and above cutting costs. Executed well, each of these four pathways can lead to success. Which pathway the telco takes depends on their existing footprint and customer base, their region, competitors and much, much more.

Figure 4: Six tenets for a successful techco transformation



Source: STL Partners

The most ambitious telcos aiming to achieve full techco transformation will address these six tenets in parallel. Infracos are likely to focus on 3, 5, and 6 as they look to unify and automate their network infrastructure, whilst servcos will prioritise 1,2 and 4 to develop customer-oriented platforms and services. Below a breakdown of each tenet.

1. **Build strong enterprise relationships:** Techcos must refine their strategies by focusing on three key areas to fulfill complex enterprise needs and gain credibility. First, they need to prioritise target verticals, establishing dedicated, agile teams that build deep connections with specific sectors such as retail or healthcare, and align their offerings with these verticals' performance KPIs. Secondly, the adoption of a DevOps mindset is vital for rapid service deployment through a CI/CD pipeline, enabling faster response to market demands. Lastly, to deliver tangible business outcomes and prompt ROI, techcos should actively engage with the developer community, understanding their needs and processes, and swiftly providing necessary toolkits to allow telcos to paricipate in the creation of solutions.

2. **Understand consumer product demands:** Telcos must prioritise a consumer-centric approach and infrastructural simplification to deliver effective services while minimising network management costs. The utilisation of data analytics is crucial for discerning customer preferences, usage patterns and behaviours, which in turn drives the development of targeted, valuable products. Moreover, meeting core consumer demands — affordability, network security and reliability — solidifies customer retention and enhances their service experience.

3. **Automate and simplify network functions:** To maximise the potential of cloud native innovation, we recommend telcos focus on these four actions:

   – Automate internal network management to facilitate the development of network-as-a-service products.

   – Collaborate to standardise API usage across the industry and ensure a unified global experience.

   – Diversify go-to-market strategies to reach the fragmented developer audience.

   – Build deep relationships with developers and move up the value chain to expand offerings and create additional revenue streams.

4. **Strengthen sustainability capabilities:** Addressing significant industry challenges, like reducing Scope 3 emissions, demands collaboration among companies, as individual organisations possess limited influence. By participating in cross-industry initiatives, telcos can collectively drive progress to benefit the entire industry, shifting from a “walled garden” mentality to a collaborative approach. This encompasses driving supply-side sustainable innovation through revised procurement standards and developing uniform Scope 3 reporting methods. Such cooperative efforts would enforce more sustainable vendor practices, align industry players on environmental performance standards, and enable consistent performance comparisons to further reduce Scope 3 emissions.

5. **Move towards horizontal structures:** Techcos need to pivot towards cross-functional teams and software-driven KPIs, moving away from traditional reliability and revenue-based metrics. By adopting a software-first mentality with KPIs centered on agility, innovation and user-centricity, telcos can promote organisational adaptability and continuous evolution. Upskilling network engineers to become product managers and forming cross-functional teams fosters collaboration, rapid prototyping and quick responses to changing customer demands, solidifying telcos' competitive stance in the evolving tech landscape.

6. **Active participation in ecosystems:** Actively engaging with independent software vendors (ISVs) allows telcos to build vertical credibility, develop enterprise relationships, access innovative technologies and scale effectively. This engagement transforms telcos from mere connectivity providers to application partners, aligns them with ISVs in specific verticals and leverages ISVs' customer insights. Telcos also gain exposure to emerging trends through innovation labs and benefit from shared go-to-market activities in an ecosystem approach. With their trusted local

presence, telcos are well-positioned to ensure application performance and provide value in the complex 5G ecosystem, solidifying their role as ecosystem orchestrators and assurance providers. In this role, telcos will have the responsibility of certifying and integrating providers across an ecosystem, using their reach to manage a diverse range of partners.

Benchmarking operators on their network and non-network capabilities provides insights into the ambitions of the organisations. To achieve full techco status is an incredibly difficult task — automating the network infrastructure whilst also developing verticalised platform strategies that drive new application revenues. This will not be the pathway for all telcos, but transformation remains a necessity for all.

If you have specific questions related to any topics discussed in this report, please contact the author, Tim Otto (tim.otto@stlpartners.com) to schedule a call.

Table of Contents

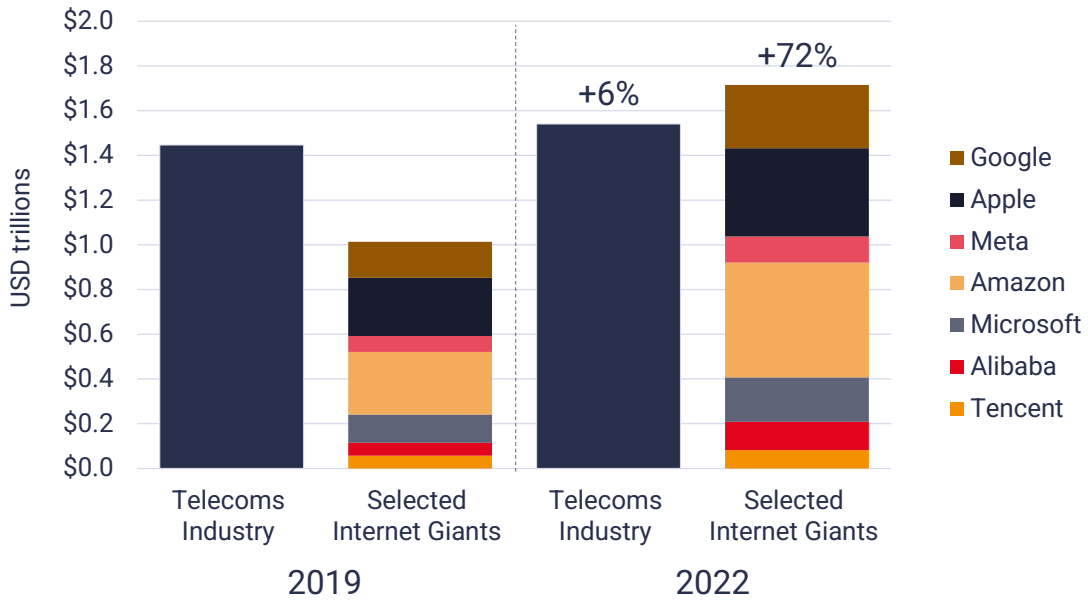
Table of Figures

Introduction

In recent years, the telco industry has seen growth stagnate as software companies infiltrate their markets and offer more innovative solutions at lower operating costs. The rapid consolidation of major internet players, such as Google and Amazon, is only increasing with time; threatening to not only undermine the telco position, but completely destabilise their revenue model and undermine their ability to operate profitably.

The top seven internet giants saw revenue growth of 72% between 2019 and 2022, pushing their total revenues above that of the telecoms industry as a whole (Figure 5 shows the revenues of all major telecoms operators and groups). As a result, telcos are urgently reassessing their business model, looking for key areas where they can cut costs and create new revenue streams, leveraging lessons learned from these internet giants to develop their proposition and ensure their long-term survival.

Figure 5: Telco revenues, 2019-2022, trillions of US dollars



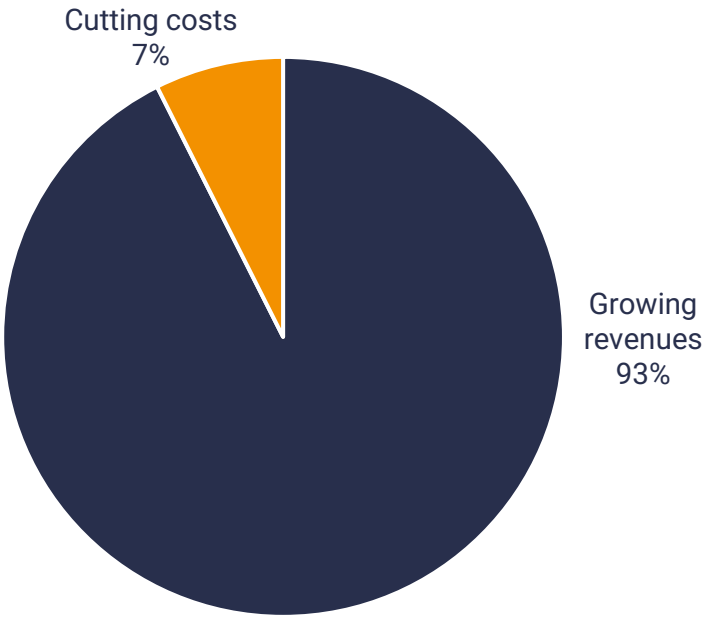
Source: STL Partners

The enterprise customer: Potential growth for techcos

Slowing of consumer profit growth has led telcos to explore the enterprise opportunity

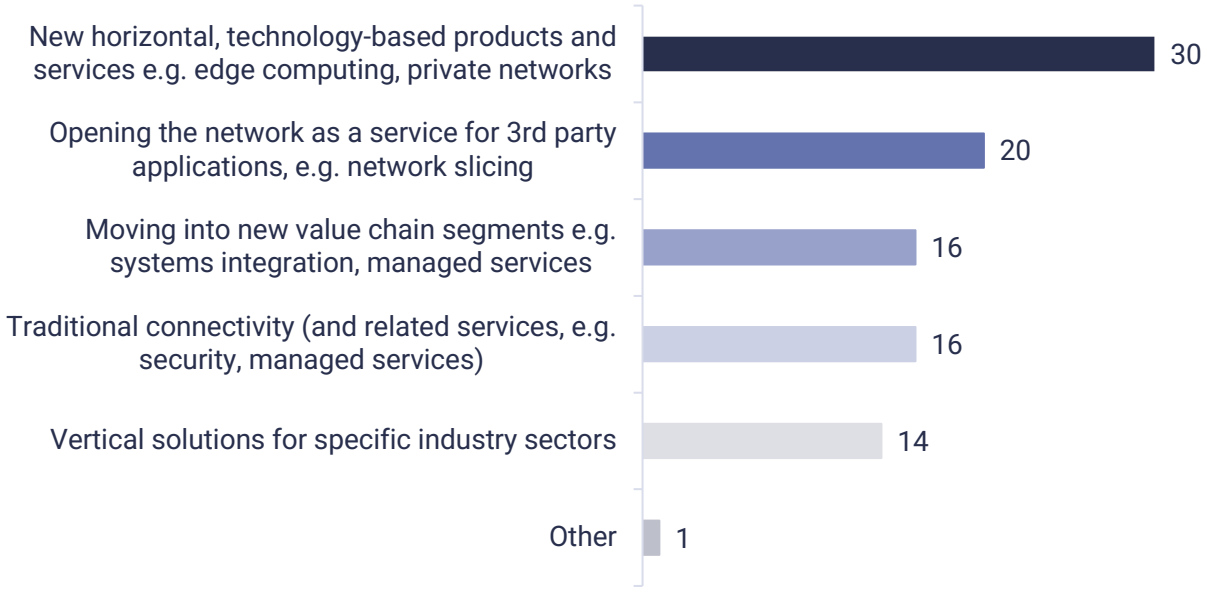
Through the move to techco, telcos hope to increase profit margins. Heavy investment in 5G rollout, as well as an increasing focus on edge computing and distributed networking is providing telcos with a valuable footprint which can be leveraged for enterprise application services – a major new growth market for telcos which have been historically limited to providing connectivity. Our survey respondents felt that growing revenues was the key strategic objectives of 5G and edge (Figure 6), and that this would be achieved through horizontal connectivity products (Figure 7).

Figure 6: Question - What is the primary business objective for your 5G and edge strategy?



Source: STL Partners "Telco to Techco" survey, 2023

Figure 7: Question – Which areas do you think will drive this revenue growth?



Source: STL Partners "Telco to Techco" survey, 2023

When asked how 5G and edge investment can drive growth, a large majority of telcos point to premium, horizontal connectivity products (see Figure 7) as the primary avenue. This fails to recognise the specific demands of different verticals, each with their own regulatory and performance metrics. Given their position in the market and the increased demand being placed on networks due to IoT and autonomous use cases, the prioritisation of networking products is logical. Horizontal products also fit the traditional telco model of horizontal connectivity, allowing telcos to leverage their central position across markets to scale these solutions to the size necessary to drive top-line growth.

Telcos lack the prerequisite skills to properly target these customers

To develop products that truly deliver value to the end-customer, telcos must first develop strong relationships within specific, vertical ecosystems to ensure these products are able to provide real business value for enterprise customers. It is notable that surveyed telcos believed that vertical-specific solutions were the least likely approach to drive revenue growth through 5G and edge (14 respondents), suggesting telcos still believe that if they build the products, the customers will come to them.

Within our benchmarking index, we measured telcos on their development of B2B enterprise groups, with techcos much more likely to give autonomy to groups focusing on specific verticals. Unlike the consumer market, enterprise customers have specific characteristics that limit the effectiveness of a telco horizontal strategy:

- **Vertical-specific KPIs:** When approaching the "enterprise market", telcos are aware that each industry operates to a diverse range of KPIs, regulations and expectations. Each industry has

unique KPIs reflecting its goals: for example, in manufacturing, annual plant output is a crucial metric, while the retail sector relies on other KPIs such as inventory turnover and customer conversion rate.

- **Siloed internal teams:** Enterprise organisations often operate with siloed internal teams, particularly in the realms of IT and operational technology departments. These teams function with distinct decision-making processes, priorities and budgets. Techcos typically have strong exposure to all decision makers across the enterprise, ensuring comprehensive buy-in leading to commercial deployments.

Telcos possess valuable technological expertise and robust infrastructure due to their longstanding role as connectivity providers. They have established extensive relationships with enterprise customers, albeit primarily centred around connectivity procurement rather than an application collaborator.

> *An obsession with the customer is required as we develop vertical specific pilot solutions. We are heavily observing private 5G and edge deployments and prioritising retail and media as initial verticals.*
>
> *VP Software Engineering, Tier-1 operator, Western Europe*

Techcos will build on their technological knowledge and physical infrastructure by developing new capabilities to meet complex enterprise requirements and build credibility as a trusted application partner. This can be achieved through:

- **Prioritising target verticals:** Despite their belief that horizontal connectivity products will drive revenue growth, telcos must develop deep relationships with vertical ecosystems and become accustomed to their performance KPIs. Leading techcos are creating discrete, autonomous groups focused on developing connectivity products for specific verticals (i.e. retail, healthcare). This creates the opportunity for greater agility for these teams which are focused on building relationships with customers and partners.

- **Adopting a DevOps mentality:** A hallmark of a techco organisation, telcos must learn to rapidly deploy new services through a CI/CD pipeline. This change is explored further in section 5, **Cloud native: Technology or mindset?**

- **Focussing on developer community:** Enterprise customers are not interested in buying new technology. They want to buy applications that provide them with a tangible business outcome, driving real ROI within a short period of time, and this value is created within the application. For application developers to adopt their connectivity solutions, telcos must actively engage them, learning their working processes and requirements, and quickly developing the necessary toolkits to facilitate adoption.

To develop scalable enterprise products, techcos prioritise development of vertical relationships and the building of credibility. Instead of focusing on horizontal products, they will develop deep vertical expertise to become a value-creating application partner.

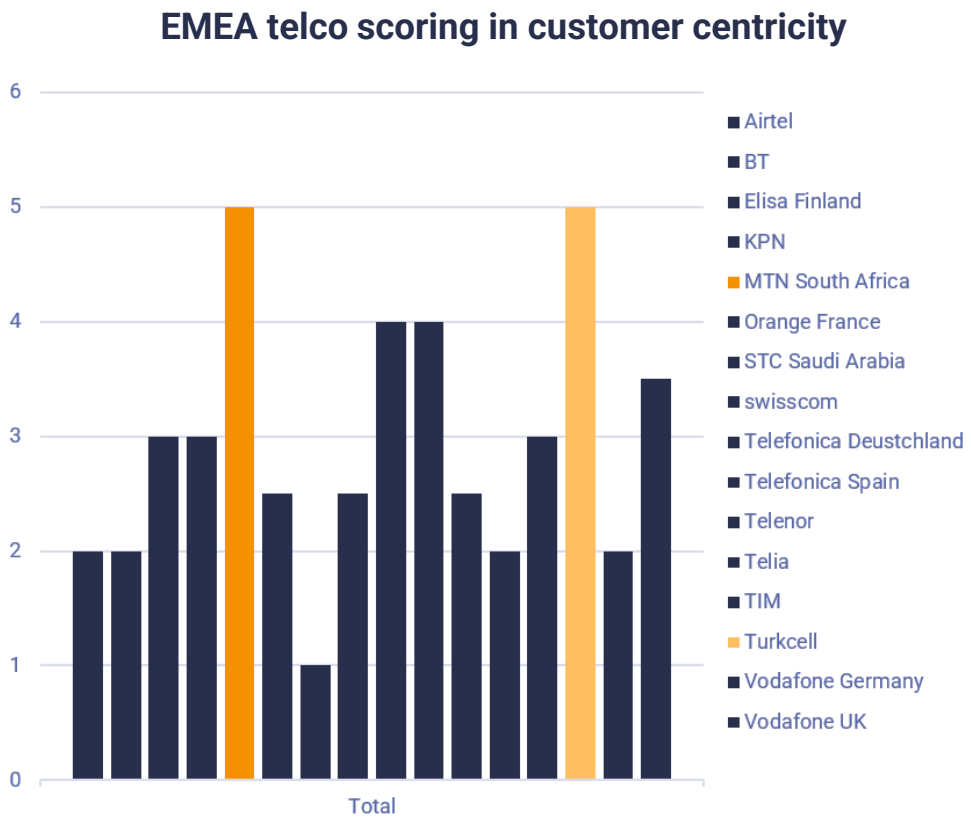
Complex and expensive networks limit the profitability of consumer products

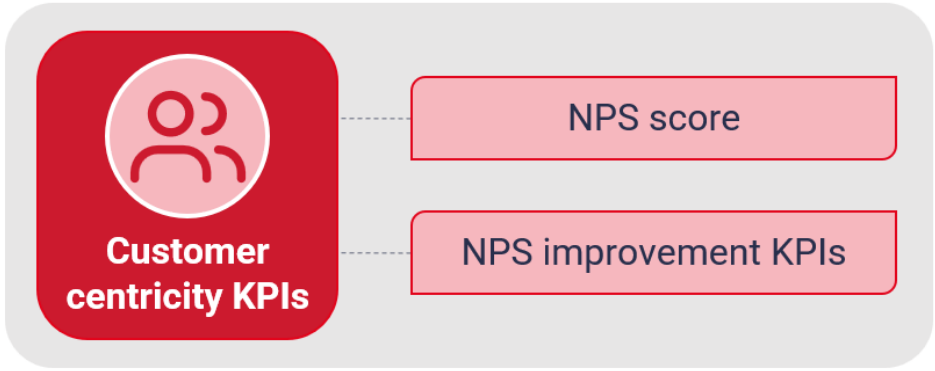
In the consumer market, streamlining and simplifying network infrastructure are viewed as crucial for reducing costs and increasing profitability. Combined with greater customer services enabled through automated chatbots, this holds the potential to increase NPS and ultimately lower churn, a key metric for consumer success.

Revenue increases as a result of 5G penetration are not enough to drive growth of the telco as a whole

Consumers hold high expectations when it comes to connectivity and customer service. They demand seamless network coverage and reliable performance regardless of their location. Meeting these expectations has become crucial for telcos, as failure to provide consistent connectivity and satisfactory customer service can lead to dissatisfied customers and potential revenue loss.

Figure 8: Output from the STL Partners, Telco to Techco benchmarking index (consumer customer metrics)





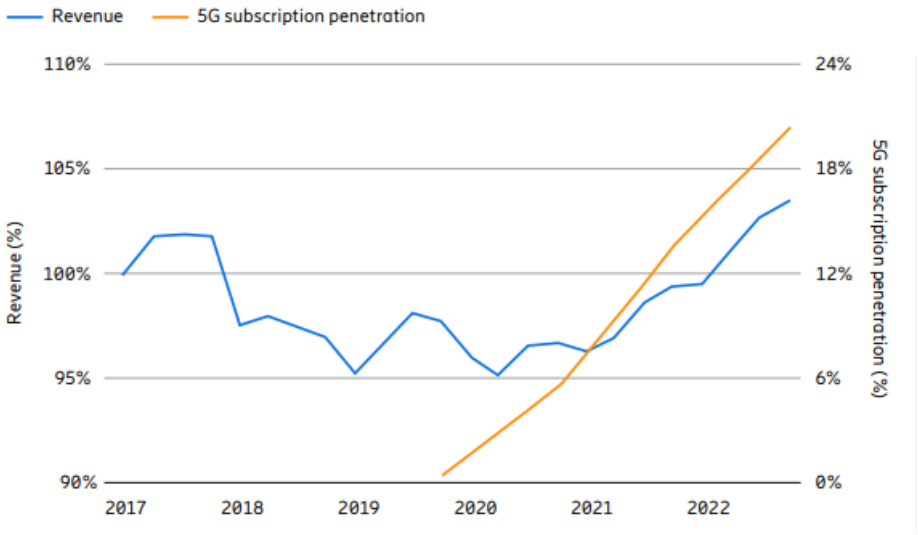
Leading techco case study: Turkcell

With a high NPS score of 58, Turkcell have **clearly defined objectives around customer centricity** to better position themselves against their closest competitors. Turkcell are engaging in **"responsible and ethical"** initiatives that drive customer satisfaction and brand trust.

Source: STL Partners, "Telco to Techco benchmarking index", 2023

There are signs that 5G is slowly leading to increased revenues in consumer segments. Particularly through bundling connectivity with OTT services (entertainment, healthcare), telcos are beginning to see a small uptick in willingness to pay from the consumer customer. Despite this, the increased revenue generation will struggle to equal the level of investment that telcos have made in their 5G standalone infrastructure.

Figure 9: 5G penetration correlates with revenue growth, stemming from premium consumer bundles



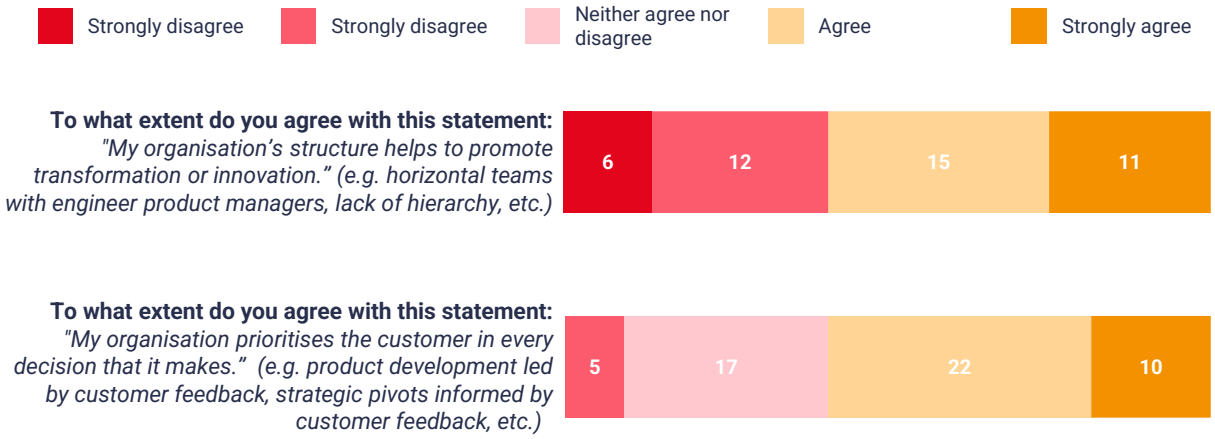
Source: Ericsson Mobility Report, 2023

As the 5G ecosystem matures, evermore opportunities for consumer upselling and additional service revenue streams will emerge. Despite this, without simplification of the underlying infrastructure management, resources will be funnelled into a complex and archaic network that could otherwise be used for the development of new enterprise services and ecosystems which have the potential to drive transformational growth (this will be discussed further in section 6, **Ecosystem participation to develop new expertise**).

Techcos will develop effective customer feedback loops and build only what is demanded

Telcos need to adopt a consumer-centric approach to better understand their customers and tailor products and services to their needs whilst simplifying the infrastructure itself. This twofold approach will allow telcos to provide effective consumer services whilst ensuring their network management costs are as low as possible. See Figure 10.

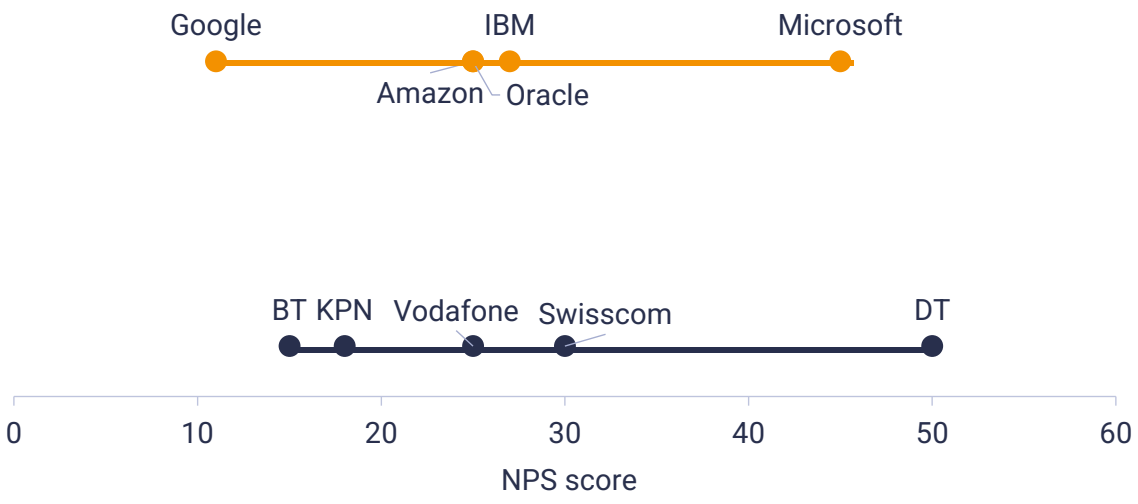
Figure 10: Telcos are undecided as to their organisation's ability to innovate and understand the customer



Source: STL Partners "Telco to Techco" survey, 2023

Surveyed telcos are generally believed that their organisations prioritise innovation and customer-centricity, although speaking to developers and other potential partners, the perception is somewhat different. Understanding the customer allows telcos to understand their priorities (reliability, coverage, price-point) and is critical factors to customer satisfaction, a key metric for revenue retention with consumers and a core characteristic of a techco. Despite hesitation from partners on their potential as collaborators, telcos are on a par with the hyperscale cloud providers when it comes to their Net Promotor Score (how likely customers are to recommend their services to others). See Figure 11.

Figure 11: Hyperscaler NPS vs. leading telco NPS



Note: cloud provider NPS scores may be swayed by adjacent groups (i.e. Amazon ecommerce)
Source: STL Partners "Telco to Techco benchmarking index", 2023; Consumer Guru

Telcos should leverage data analytics to gain insights into consumer preferences, usage patterns and behaviours. This information helps them understand customer demand as well as enabling the development of targeted products and services that provide value and meet specific needs. Meeting core consumer demands includes offering low-cost subscription plans for price-sensitive customers, ensuring network security measures and prioritising network reliability to deliver consistent and uninterrupted service.

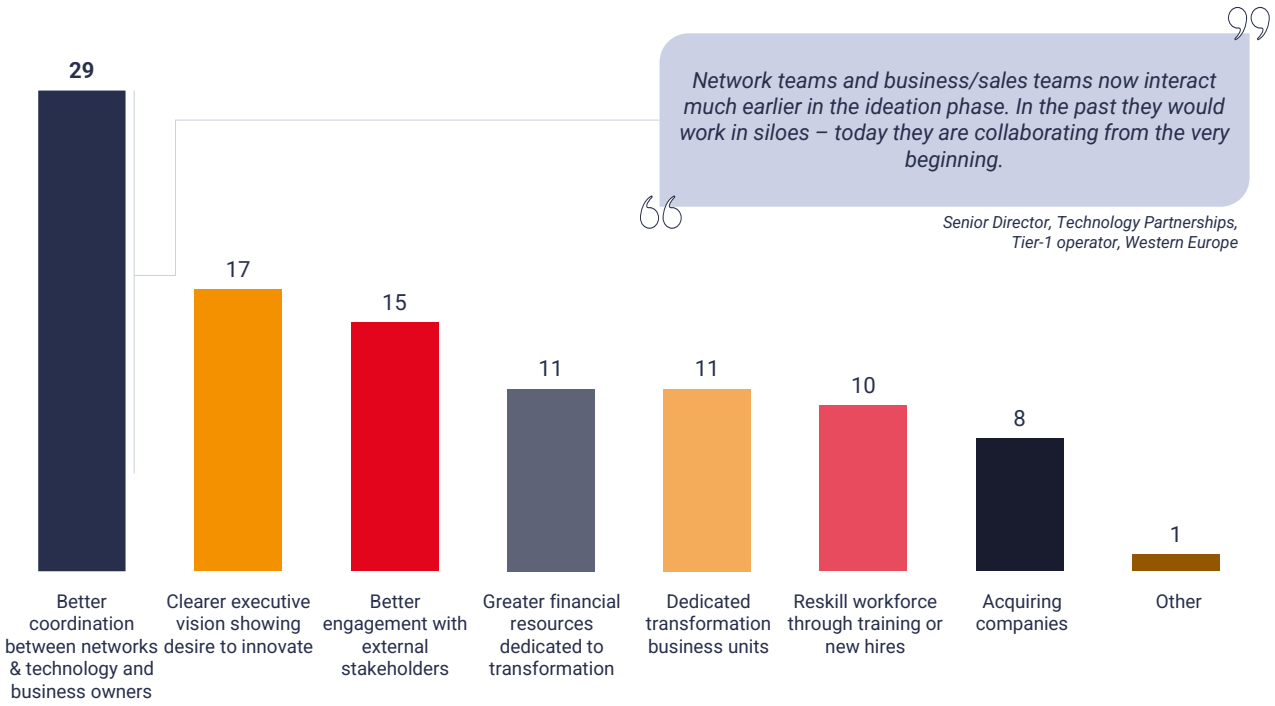
> *Achieving digital consumer service aggregation is our primary innovation target, as laid out by our executive team*
>
> *Head of Strategy, Tier-2 operator, Northern Europe*

Changing the organisational model of a telco

Becoming a techco requires a more horizontal structure with fluid roles

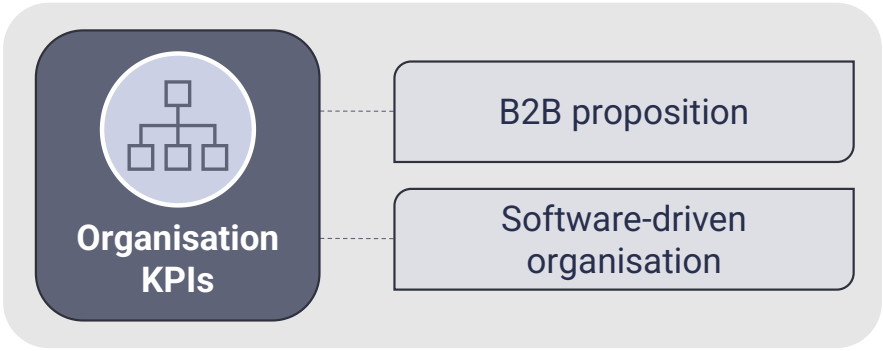
As telcos look to adopt the rapid deployment models necessary to capture value in a cloud-native world, traditional hierarchical structures are proving to be a barrier to innovation and growth. To successfully transform into a techco, telecom operators must adopt a more flexible and horizontal organisational model that gives smaller teams greater autonomy to build, deploy and manage new capabilities within the network and beyond.

Figure 12: Question – Which steps do you think your organisation should prioritise to better facilitate digital transformation in the next 3 years?



Source: STL Partners "Telco to Techco" survey, 2023

Figure 13: Output from the STL Partners, Telco to Techco benchmarking index (Organisational model metrics)



Leading techco case study: Deutsche Telekom

Deutsche Telekom's **5G Campus Networks** deliver strong data security and speed for businesses. Their work with OSRAM showed how these networks can **optimize automation and productivity** for industries like **manufacturing and sports**, providing real ROI for enterprise customers.

Source: STL Partners, "Telco to Techco benchmarking index", 2023

The transition to a horizontal structure involves reimagining the traditional top-down management approach. Instead, decision-making authority is distributed across cross-functional teams, empowering employees at all levels to contribute and innovate. By embracing a fluid roles framework, telcos can break down the silos that hinder collaboration and facilitate a more agile working environment.

Although telcos have historically been slow to move away from these hierarchical and siloed structures, leading techcos are beginning to show signs of adopting a DevOps mindset, transforming the basic skillset of the organisation and migrating to working practices traditionally seen in more agile software companies.

Cross-functional teams with software-first KPIs will lead telcos into the new world

To thrive in the digital era, telcos must embrace cross-functional teams and align their key performance indicators (KPIs) with software-driven objectives. Traditional telco KPIs often focus on metrics such as reliability (ensuring the network never experiences downtime) and revenue growth, which are necessary but not sufficient in the technology-driven landscape.

By adopting software-first KPIs, telcos can prioritise agility, innovation and user-centricity. Techco KPIs focus on the capabilities of the organisation – its ability to react quickly and continually evolve – rather than on the results.

Prioritising the growth of the internal functions of the company rather than focussing on outcomes encourages a techco to develop its skills and capabilities, ensuring that it remains ready for the rapidly changing environments of technology customers. Unlike traditional telco business, these customers expect constant iteration and improvement over and above reliable, long-term commitments. This represents a huge shift in thinking and a major challenge for most telcos.

Figure 14: A leading telco has adopted DORA metrics as key KPIs, prioritising agility and speed over reliability

Traditional telco KPIs	DORA metrics
Network downtime *Duration of network outages, measured in minutes or hours*	**Deployment frequency** *How often does the organisation deploy code to production or release to end users*
Customer churn rate *Percentage of customers who discontinue their services in given time frame*	**Lead time for changes** *Tracking lead time for changes to an application*
Number of SIMs sold *Tracking number of SIMs sold to indicate company growth*	**Time to restore services** *Time taken to restore a service when an incident or defect takes place*
ARPU *Measures revenue per customer to provide insight on pricing strategy, revenue generation, etc.*	**Change failure rate** *Percentage of changes to service result in degradation of service provided to the customer*

Source: STL Partners

A leading European operator described its adoption of the DORA metrics developed by Google. These metrics have been adopted across the organisation as it looks to disseminate a software-first mentality throughout the team, emphasising speed, agility and reaction time over reliability. This is enabling it to adopt a DevOps approach and will set it up to develop new services and capabilities down the line.

We also spoke to leading telcos upskilling network engineers to become product managers, ensuring technical stakeholders also have commercial targets. Cross-functional teams bring together individuals with diverse skill sets, including engineers, data scientists, designers and marketers, fostering collaboration and innovation. These teams are empowered to work autonomously, rapidly prototyping and iterating on ideas, and responding quickly to changing customer demands.

> *With AGI, the price and complexity of software engineering is plummeting dramatically. This gives us massive opportunities to automate in areas of the organisation where it would be costly to do so in the past.*
>
> *Head of Strategy, Tier-2 operator, Northern Europe*

Sustainability: No longer a nice to have?

Telecoms operators recognise that embracing sustainability as a strategic priority has become imperative. Beyond the universal need to drive more efficient resource utilisation, telcos face pressure from all stakeholders to establish sustainability as a key priority. Shareholders and investors recognise the importance of sustainability to an organisation's competitiveness and viability in the long-term. Telcos which fail to focus on sustainability risk losing out to their competing technology players, such as Google and Microsoft, which have made more headway than most telcos. However, to progress in their sustainability journey, and to motivate the change that is required, telcos should prioritise engagement and coordination not only within their organisation but also with the wider industry.

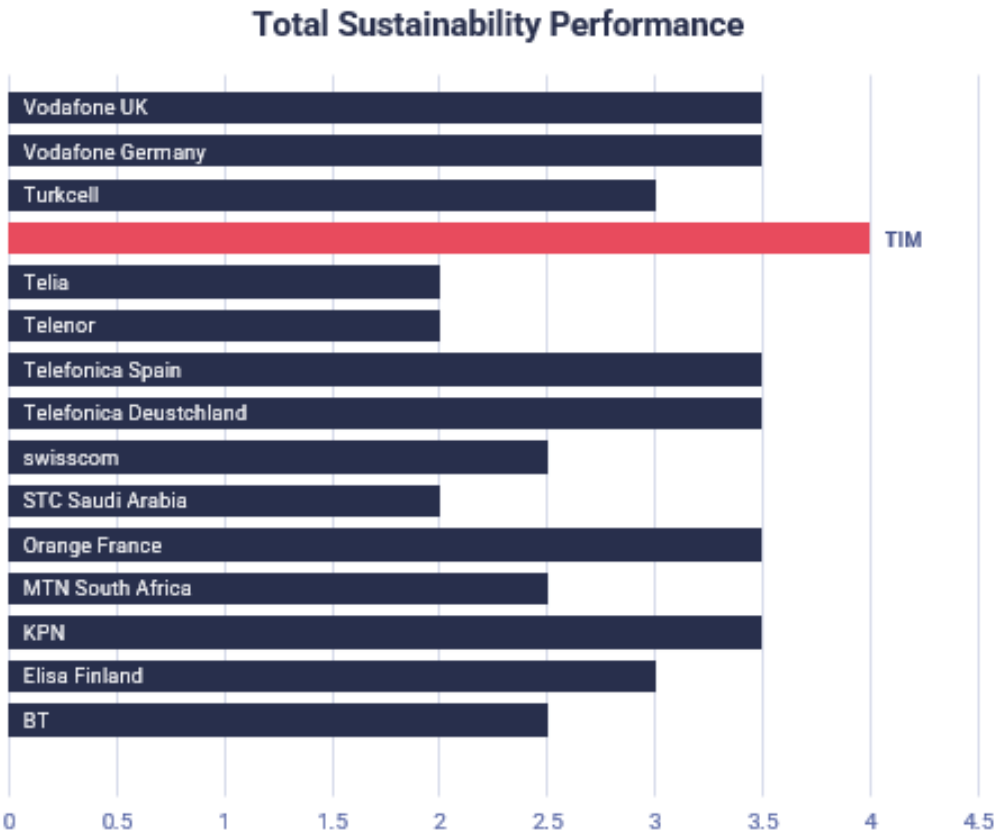
To reach net-zero targets, telcos must embed sustainability across the organisation

Telco sustainability teams are primarily responsible for providing the direction and agenda for sustainability across the organisation. These teams are involved with activities such as gathering data for annual reports, setting targets and pushing the agenda across the organisation. However, to successfully embrace sustainability as an urgent priority, telcos must embed sustainability into the heart of the organisation. This will ensure it is integrated into everyday operations across different business units.[1]

As traffic levels rise, telecom operators face the dual challenge of accommodating increased demand while diminishing their environmental footprint, a mandate intensified by the recent energy crisis. This isn't just about cost-efficiency but also meeting the expectations of customers, investors, and employees. With growing and diversifying user demands and predicted tripling of metro network traffic by 2030, operators must innovate. Less advanced operators will adopt basic measures (like upgrading copper to fibre), whilst leading organisations will apply best practices (like resource sharing and extending infrastructure lifespan), and next practices (like decentralising routing fabric). Notably, achieving true sustainability requires industry-wide collaboration, including adoption of sustainable design principles and establishing universal standards for reporting and measuring emissions.

[1] To read more about the key takeaways for other telco business units, see our recent report, How to embed sustainability across a telco.

Figure 15: Output from STL Partners Telco to Techco benchmarking index (sustainability metrics)



Sustainability KPIs

- Scope 1, 2 & 3 reporting
- Enablement of customer sustainability

Leading techco case study: TIM

TIM has set targets as part of their ESG plan to reduce GHG emissions across Scope 1, 2, and 3 by 2040. Their climate strategy entails **"47% reduction in upstream and downstream emissions occurring in the value chain by 2030"** and **"Net Zero emissions by 2040"**. TIM's proposal on sustainability is validated by the Science Based Targets initiative (SBTi) and is in line with Paris Agreement.

Source: STL Partners, "Telco to Techco benchmarking index", 2023

Key recommendations for telco sustainability teams include:

- **Develop realistic and achievable targets and deliver:** Telcos should balance both a realistic and ambitious mindset to choose the right targets for their organisation. Failing to meet set targets, no matter how ambitious, will cause telcos to lose credibility with stakeholders and may appear to be greenwashing. To choose the right targets, sustainability teams should consider bottom-up data and the internal resources available, alongside other external factors such as market constraints and potential future regulations.

- **Achieve buy-in across the organisation:** Support from different levels of the organisation is key to ensure engagement across business units. Telcos should establish the support and authority from senior leadership to legitimately lead change through other areas of the organisation. At the same time, telcos must also approach different business units with their specific goals and operating model in mind if they are to achieve active and successful engagement with sustainability initiatives.

  – For example, procurement and networking business units have different resources, KPIs and organisational structures. Therefore, sustainability teams should develop unique strategies that align with the nature of different business units to secure better engagement and maintain momentum to meet their targets.

- **Explore different ways of delivering sustainability:** Telcos are focussed on initiatives that reduce their own Scope 1, 2 and 3 emissions. However, there is an additional opportunity to offer services that enable customers to reduce their own emissions to support their net-zero targets. Telcos can respond to the increasing customer demand for sustainable products and services which in turn will provide differentiated brand value beyond connectivity. Notably, STL sees many of the best examples of net-zero enablement services coming from big technology companies such as hyperscalers.[2]

> *Core network transformation is about softwarisation and is a true shortcut to ensuring the telco industry becomes more sustainable and efficient.*
>
> *VP Software Engineering, Tier-1 operator, Western Europe*

Collaboration will be instrumental to accelerate sustainability across the industry

Collaboration between companies is crucial to solving key industry challenges that individual companies have little influence over, such as the reduction of Scope 3 emissions. Scope 3 refers to

[2] STL Partners' Telecoms net-zero enablement use case directory details sustainability use cases and case studies that telcos can offer to their customers to enable them to reach net-zero.

emissions incurred by other segments of the value chain, including those produced from vendors and the end-customer. Scope 3 is the largest category of emissions but is also the most difficult for individual organisations to influence due to the limited control and transparency over other players in the supply chain and the end-customer. Participation in cross-industry initiatives enables telcos to take collective action and drive progress to benefit the entire industry. Telcos should break out of their traditional "walled garden" mentality and instead embrace collaborative efforts which will help to solve some of the individual challenges they face. To do this they should:

- **Drive supply-side sustainable innovation:** Operators should influence vendors through their procurement standards. If operators collectively raise their sustainability standards and refuse to purchase solutions that do not meet them, vendors will be forced to produce more sustainable products, driving improvement from the supply-side of the industry.

- **Develop greater standardisation:** Greater standardisation on sustainability metrics will accelerate sustainability efforts across the industry. There are several sustainability metrics that should become more standardised, including how to measure the life expectancy of kit and the power efficiency of equipment. Through cross-industry initiatives, players across the value chain should aim to align on sustainability metrics and define common standards and methods of assessment for these critical environmental performance metrics.

- **Develop standard Scope 3 reporting:** Scope 3 emissions are currently measured differently across the telecoms industry, making it difficult to compare performance across different players and drive progress. Collaboration within the industry to develop common reporting frameworks will drive Scope 3 emissions reduction.

Cloud native: Technology or mindset?

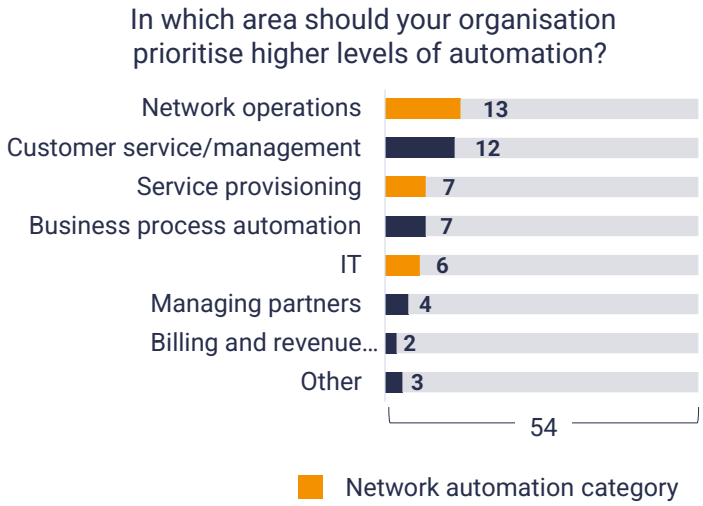
Cloud native infrastructure has emerged as a transformative force for the telecommunications industry, offering significant simplification and cost-saving opportunities. By leveraging cloud technologies and principles, telcos can modernise their networks, streamline operations and improve scalability.

In our benchmarking index, we tracked the progress of telcos in the transition to Open RAN, as well as the number of network functions that have already been virtualised/containerised. Whilst this empirical approach tracks the technological progress of the telcos, true cloud native operations require a significant mindset shift, leveraging the programmability of cloud native functions to develop automation throughout the organisation.

Network-as-a-service will enable techcos to offer transformative products

Our survey suggests that network automation is a major strategic focus for most telcos, with customers service automation representing a quick win. See Figure 16.

Figure 16: Question – In which area should your organisation prioritise higher levels of automation?



> *Customer service centres are a clear quick-win for automation for telcos. We are working to build chatbots which can free up human resources.*
>
> *Head of Strategy, Tier-2 operator, Northern Europe*

Throughout our research, telcos consistently mentioned their strategic focus on automation. Implementing automation within the network involves simplifying the currently complex layers of the network infrastructure.

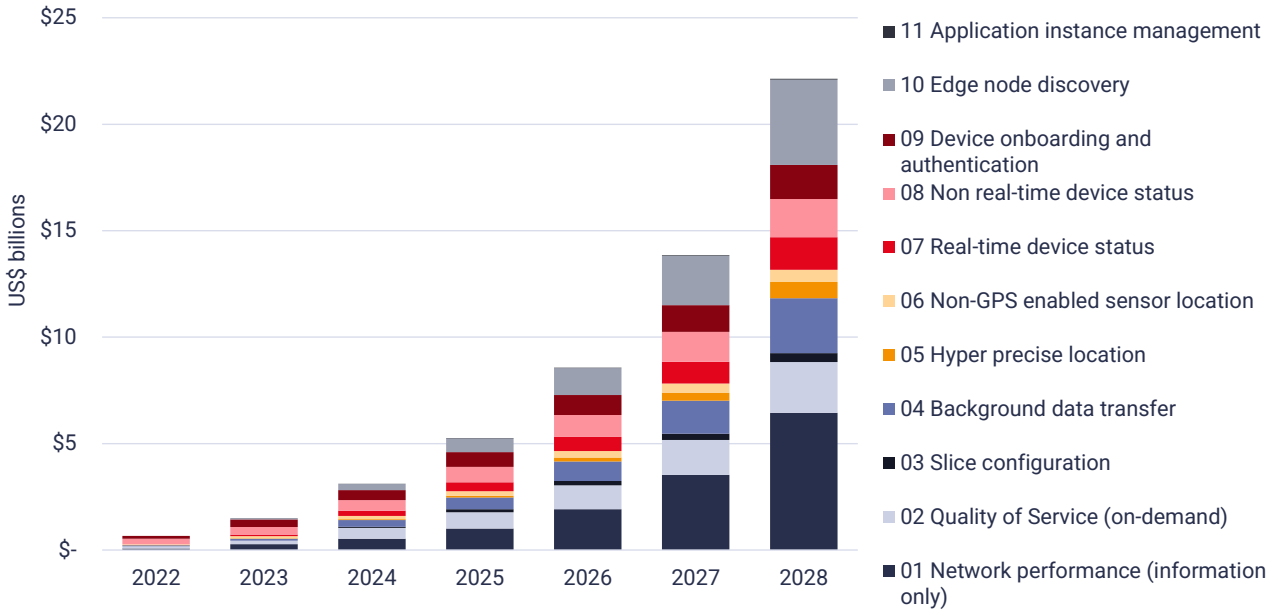
Source: STL Partners "Telco to Techco" survey, 2023

Our survey found that telcos see customer service as a quick win, whilst network operations and service provisioning pose a significant opportunity for cost savings through automation. Throughout the industry operators are collaborating to develop network APIs that will initially be used to automate internal processes, before being exposed to customers for advanced network services.

Network-as-a-service (NaaS) is poised to be a major growth market for both telecoms and non-telecoms companies in the coming years. However, telecoms operators will likely capture a smaller

share of the overall NaaS market compared to their historical share of the network services market. As shown in Figure 17, the top 11 mobile network APIs alone are projected to generate over US$22 billion by 2028, accounting for 2.3% of total mobile service revenue worldwide.

Figure 17: Global mobile network API revenue opportunity



Source: STL Partners, "Network APIs: Driving new revenue streams for telcos", 2023

To fully capture the NaaS opportunity, the telecoms industry must complete the transformation of networking into a cloud-delivered service. This will result in a converged "open telco cloud," where telecom operators, vendors, hyperscalers, application developers, enterprises and non-telecom networking providers can develop, operate, and consume networking capabilities and services on demand.

Internal automation and industry collaboration are critical steps to true cloud native NaaS

There are several steps that telcos must take to ensure cloud native innovation fulfills its revenue driving potential:

- **Internal automation:** As telcos develop and deploy APIs across their internal networks, including documentation and SDKs, they can evolve the necessary skills to then create real products around network as a service.
  - Techcos will automate most of the network management and provisioning through network APIs. Telecoms networks require some of the most complex network applications in production, providing telcos with the perfect learning opportunity. Of the operators that we spoke to, almost all mentioned the importance of automating and simplifying network management.

- **Industry collaboration:** Telcos must collaborate to develop standard ways of working with APIs to ensure a third-party aggregator does not take the opportunity of a fragmented ecosystem. Given the global scale of application developers and cloud providers, telcos must be able to provide a consistent experience across regions.
- **GTM development:** As network APIs are exposed to customers, advanced telcos will leverage a diverse range of distribution channels to reach their customers (the application developers). Given the fragmented nature of the enterprise market which application developers serve, there will be no single platform through which network APIs will be consumed.
- **Move up the value chain:** As developers begin using network APIs, telcos can move further into the application layer. As they develop these skills, techcos can begin to build vertical expertise, developing adjacent propositions to create additional revenue streams for the organisation.

> *Today, we are focused on building standard network APIs and ensuring that we are collecting the right data from the network. If we do not have the right data, we cannot make informed decisions.*
>
> *SVP Technology Innovation and Ecosystems, Tier-1 operator, Western Europe*

Ecosystem participation to develop new expertise

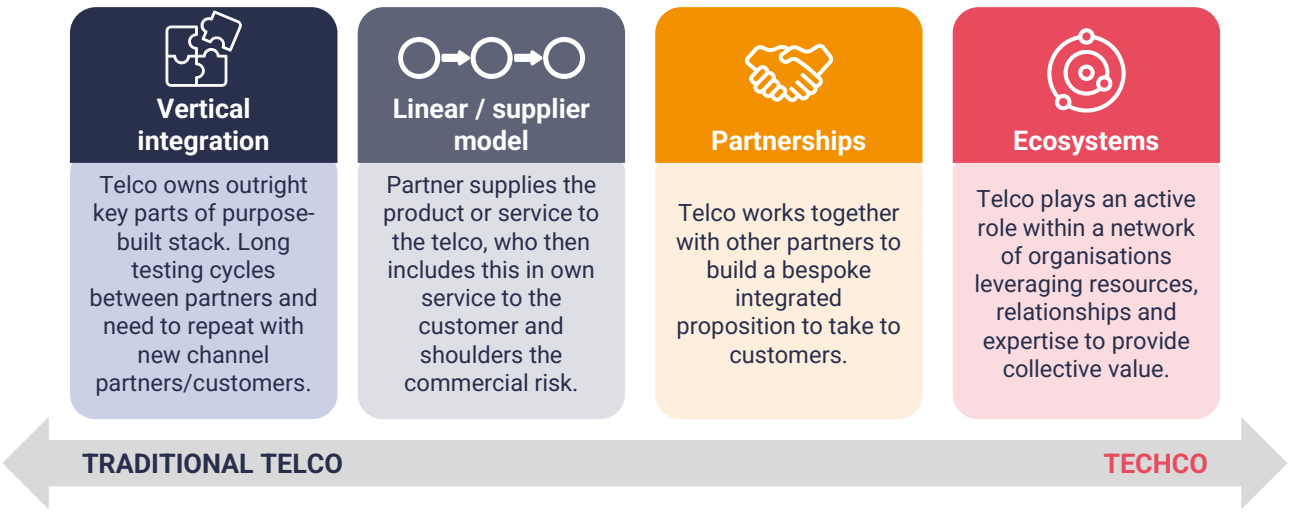
Techcos will leverage the skills of others through diverse ecosystems of partners

Historically, operators had a narrow partnership approach. They focussed on long and contractual relationships with NEPs, restricted to innovation with contracted partners. Whilst this approach served the traditional telco and their horizontal connectivity offerings, to transition to a techco, operators must fundamentally transform their partnership approach.

To capture the enterprise opportunity, operators must do the work to evolve their reputation as purely connectivity providers; they must demonstrate that they have the vertical-specific expertise and capabilities to address enterprises' unique requirements that go beyond connectivity. Operators must transition to an ecosystem approach whereby they actively engage with a more diverse set of partners across the value chain to develop these sector-specific expertise and capabilities.

Ecosystem business models vary in shape and character, but fundamentally, they indicate a significant shift from the traditional closed partnership approaches. To deliver a vertical solution, a traditional telco would coordinate with a group of pre-defined partners across the value chain to develop the bespoke stack for the enterprise customer. This is an often uncollaborative, manual process that is resource-intensive for all partners involved. Techcos, on the other hand, leverage an ecosystem approach which encourages active engagement and dynamic collaboration between a network of players across the value chain. See Figure 18.

Figure 18: Techcos will leverage open ecosystems for greater innovation and competition



Source: STL Partners

Adopting this model is a key challenge for the traditional telco, which naturally has a walled garden mentality. However, traditional telcos should follow the example of techcos which are embracing engagement with a diverse group of partners as a means of accessing resources, capabilities and expertise that is not in their traditional portfolio.

ISVs will bring applications and expertise to telcos developing their sector-specific capabilities

Actively engaging with ISVs and fostering an ecosystem approach has many benefits for telcos.

- **Build vertical credibility:** Actively pursuing a high level of engagement with ISVs will enable telcos to build their credibility and experience as they begin to participate in new target areas. Telcos are seen as a connectivity provider, not an application partner. As a result of working with ISVs which are deeply engaged within a specific vertical, the telco itself is aligned with that vertical and its brand aligned with that of the ISV.

- **Develop enterprise relationships:** ISVs have a strong understanding of their customer, leveraging data insights and customer feedback into their application development process. Telcos can access this insight to gain a better understanding of the enterprise customer whilst building new relationships.

- **Access technology innovation:** Active engagement through innovation labs gives operators a unique opportunity to participate in the development stage of applications, establishing their value earlier on in the service delivery process. ISVs also provide operators with greater exposure to innovative technologies. This in turn can enable a more market-driven approach by identifying emerging trends and verticals as customer demand starts to shift as markets begin to mature.

- **Scale more effectively:** An ecosystem approach allows telcos to benefit from the GTM activities of the whole ecosystem, distributing this effort amongst a collection of highly specialised groups.

  – An incumbent operator that participated in our research has over 50 private 5G deployments across Europe at the group level. Building expertise and experience through its ISV relationships, allowed it to develop its expertise within its target verticals and accelerate deployments by demonstrating itself as a trusted partner to enterprises. Over time, the operator also managed to reduce deployment costs through repeated experience with a particular vendor.

> *Building partnerships is new for us but it is something that is needed to make the whole case happen. The ecosystem is obviously important, which is something new for telcos that have so far only sold connectivity.*
>
> *VP Campus Networks, Tier-1 operator, Western Europe*

Telcos can leverage their trusted local presence to provide value and assurance in an open ecosystem

An ecosystem approach is necessary for most 5G environments. This more complex model brings with it more complex assurance protocols that require far greater observability across applications from multiple vendors to isolate errors and track performance metrics to ensure the proper performance of the application.

Given their position as an intermediary between these applications (data being shared across the network between applications), some ambitious telcos see themselves as the natural orchestrator and assurance provider of the ecosystem. Due to their trusted reputations as local partners, operators are well positioned to take on this role to provide assurance to enterprise customers. This is in comparison with other global players such as hyperscalers.

> *Building local partnerships for individual lighthouse projects are not that difficult, the critical issue is how to scale this to a broader market. Partnerships with hyperscalers are really important for us to reach a broader scale.*
>
> *VP Campus Networks, Tier-1 operator, Western Europe*

Conclusions and recommendations

There will be no single path that telcos take on their transformation journey. As extremely large organisations, telcos must prioritise their focus and align these with their ambitions. Given the extensive disruption coming from hyperscalers and internet players, the traditional business model which has given telcos consistent revenue growth for the past 30 years must evolve, but the specific strategies that each telco takes will be determined by the priorities of decision makers and the execution on the ground.

The nirvana is the techco: an agile organisation, rapidly deploying software across an autonomous and flexible network that responds to the demands of both consumers and enterprise customers. This kind of organisation does not yet exist, and the leading telcos who are aiming for this banner will struggle under the immensity of the challenge. Revolutionising network technology whilst also building vertical specific applications, restructuring employees whilst building enterprise relationships, and deploying next generation network technology whilst lowering emissions and improving carbon reporting: to become a techco is to push and pull at the same time.

But telcos must transform. By narrowing strategic focus and building slowly over time, telcos can leverage their significant market reach to become a next-generation organisation.

Enterprise customer recommendations

Deepen vertical expertise

- Prioritise relationships within specific verticals.
- Focus on vertical-specific solutions and establish dedicated teams for areas like retail or healthcare.
- Enhance Skills & Adopt Techco Mentality.

Transform from just connectivity providers to trusted application partners

- Implement a DevOps approach and engage closely with the developer community.
- Reassess Strategy Based on Market Realities.

Balance focus between horizontal and vertical offerings

- Engage proactively to understand and deliver the real business value sought by enterprises.

Consumer customer recommendations

Streamline & simplify infrastructure

- Reducing network complexity can decrease costs, boost profitability, and enhance customer satisfaction.
- Automation, like chatbots for customer services, can elevate the Net Promoter Score (NPS) and reduce churn.

Adopt a consumer-centric approach & innovate

- Understand consumer expectations for seamless connectivity and tailor products/services accordingly.
- Prioritise customer feedback and innovation, and develop CI/CD pipelines for agility.
- Leverage data analytics to grasp consumer preferences, design targeted offerings, and ensure network reliability.

Maximise 5G potential & assess investments

- While 5G presents revenue growth opportunities, particularly through bundling with OTT services, the return on investment in 5G infrastructure must be critically assessed.
- As the 5G ecosystem matures, ensure that resources aren't just funnelled into managing complex infrastructure, but also explore transformative growth opportunities in new enterprise services.

Organisational recommendations

Adopt a more horizontal & fluid structure

- Move away from traditional top-down hierarchical structures that hinder innovation.
- Embrace cross-functional teams, giving them autonomy to build, deploy, and manage capabilities.
- Empower all levels of the organisation with decision-making authority to foster agility and innovation.

Prioritise software-first KPIs

- Shift from traditional KPIs focused on reliability and revenue to software-centric metrics that prioritise agility, innovation, and user-centricity.
- Embrace metrics such as Google's DORA to stress speed, agility, and reaction time over just reliability.
- Develop the internal capabilities and skillset to cater to technology customers expecting constant iteration and improvement.

Upskill and foster cross-functional collaboration

- Transform traditional network engineers into product managers and ensure technical stakeholders are aligned with commercial targets.
- Allow these teams to work autonomously, enabling rapid prototyping, iterative development, and a swift response to changing customer demands.
- Hire skilled workers with experience of software development.

Sustainability recommendations

Integrate sustainability across the board

- Recognise its importance for long-term competitiveness against giants like Google and Microsoft.
- Imbed it into daily operations, managing the balance between rising traffic and reducing the environmental footprint.
- Ensure organisational buy-in, aligning strategies to specific unit goals and offering sustainable services modelled after hyperscalers.

Set clear, informed sustainability goals

- Rely on comprehensive data to set and meet realistic targets considering market constraints and potential regulations.
- Go beyond self-reductions, providing services that empower customers to meet their sustainability objectives.

Champion collaborative industry-wide initiatives

- Overcome isolated approaches to jointly tackle challenges like Scope 3 emissions.
- Influence vendor behaviour with stricter sustainability procurement standards, standardise industry metrics, and advocate for uniform reporting to enhance transparency and comparability.

Cloud native recommendations

Prioritise mindset over technology

- Foster a cloud-native mindset to drive automation across operations.

Capitalise on the Network-as-a-Service (NaaS) opportunity

- Accelerate the transition to a cloud-delivered networking service.

Strategise for cloud native NaaS success

- Prioritise automating network management and provisioning.
- Lead collaborative efforts for standardised API practices.
- Develop varied go-to-market strategies.
- Explore opportunities in the application layer and vertical sectors.

Ecosystem recommendations

Transform partnership approach

- Move away from restrictive and traditional partner relationships.

- Embrace a dynamic ecosystem model, promoting collaboration across diverse players in the value chain.
- Overcome the "walled garden" mentality and actively engage with various partners for expanded expertise and resources.

Engage with independent software vendors (ISVs)

- Foster relationships to enhance credibility in target areas.
- Utilise ISV insights to better understand enterprise customers and tailor offerings accordingly.
- Participate in the early stages of application development and tap into innovative technologies.
- Collaboratively market and scale offerings, leveraging the combined strengths of the ecosystem.

Position as the ecosystem orchestrator

- Exploit the intricate nature of 5G environments to take on an orchestrator role.
- Implement robust assurance protocols to monitor multi-vendor applications, ensuring optimum performance.
- Leverage the trusted local presence to offer unparalleled value and assurance to enterprise customers.

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