

2022
REPORT

telecoms
INTELLIGENCE 

ANNUAL INDUSTRY SURVEY

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Contents



Introduction

Written by **Armita Satari**, Head of Custom Content, **Telecoms.com**

The relevance of telecommunications has increasingly grown over the course of modern history. Early in the 20th century as World War One progressed, so did the appreciation for tactical advantages telecommunications could provide the military. Since the start of the dotcom bubble, our societies and lives have further transformed exponentially. Today, in the face of yet another war in Europe, human rights revolution in the Middle East, recovery from a pandemic, and an ever growing economic crisis globally, telecommunication infrastructures and the services they enable continue to highlight their undeniable significance.

As the following chapters of this report will show, our 2022 Annual Industry Survey has also picked up on a sense of appreciation and achievement in telecoms. Some of the industry's recent strides can be attributed to the adoption of 5G, others to the efforts made to deliver seamless connectivity, as life shifted to our homes during the peaks of the pandemic. As such, in 2022 we find that our industry has yet again proven it stands at the heart of people's lives.

With more technological advances than ever before, the industry is also undergoing a changing market structure. These are in part driven by the interconnections between telecoms' core players – the communication service providers (CSPs) – and the wider ecosystem.

These interconnections include the likes of cloud providers, partnerships with content producers, and deals on offloading and releasing of telecom towers to and from Towercos.

Meanwhile, the notion that the sector is turning into a utility has been brewing for several years. Given the increasing reliance on telecommunications for people and public services and the benefits the digital infrastructure unlocks for humans and economies, one would assume this a notion to embrace.

However, CSPs have found themselves with predominantly flat revenues over the past decade, while those utilising the telco services for their own businesses (e.g. Big Tech) have reaped the benefits. New prognoses

also point to further economic hardships expected in 2023. These may impact the telecom sector more than the financial fallout the industry experienced immediately following the pandemic lockdowns. Combined with other existing market pressures, these may well stress the average telco bottom-line.

Given the new market structures and economic dynamics, there is reason for the industry to prepare for potential financial pressures.

As such, this makes for a good time to take stock at how telecom industry professionals, and the organisations they represent, are preparing for challenges and threats ahead, as well as to find out where they foresee drivers and opportunities across

several domains central to telecoms. Along with the wider industry performance presented in the industry landscape section of this report, the domains investigated in our survey include: 5G, Digital Transformation, BSS Monetisation, Broadband Service Management, Video, IoT, and Open RAN.

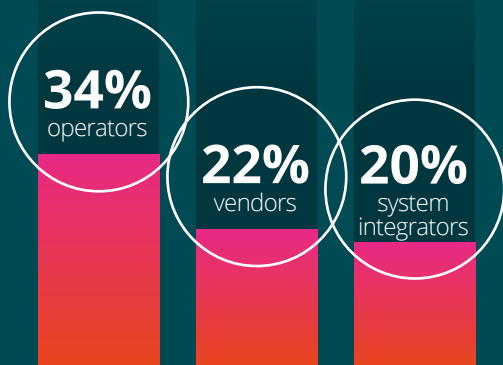
With that in mind, and as ever, it is our privilege to present you our 2022 Telecoms.com Annual Industry Survey report. We would like to thank our participants and supporters of the survey for making this activity possible and hope you find the results as insightful as we do.



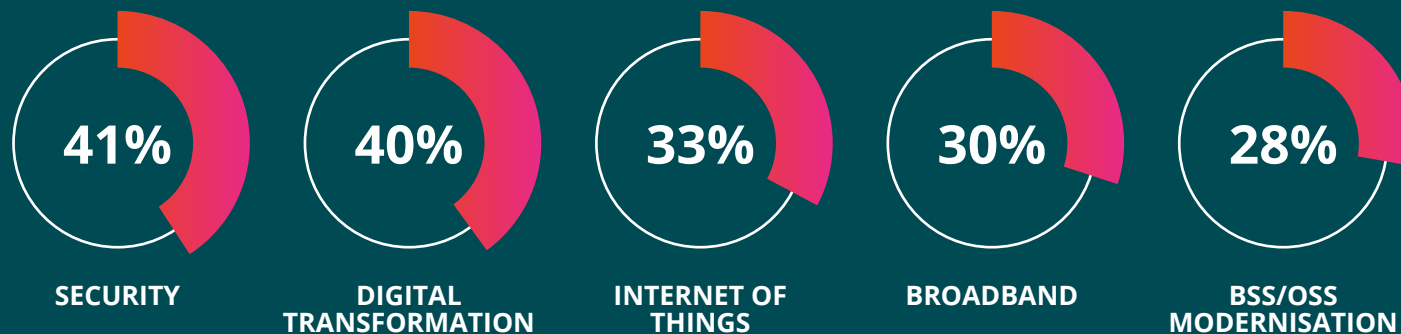
ANNUAL INDUSTRY SURVEY 2022 REPORT

SURVEY RESPONSES

SURVEY RESPONDENT BREAKDOWN:



TELECOMS INDUSTRY'S PRIORITY INVESTMENT AREAS:



81%
Security concerns of running telco applications in the public cloud

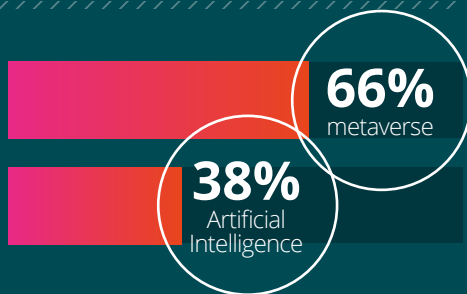


63%
2022 has been a good year for telecoms



69%
Telecoms has a positive outlook for 2023

MOST OVERHYPED EMERGING TECHNOLOGIES OF TODAY:



GREATEST POTENTIAL THREATS TO LONG-TERM BUSINESS SUCCESS:





INDUSTRY LANDSCAPE

KEY TAKEAWAYS:

- Around two out of three respondents believe the industry's performance in 2022 has been either excellent or good
- More than two thirds view the industry's business outlook for 2023 as positive, including about a third that believe the outlook to be very positive
- Security and Digital Transformation are the top two priority investment areas for the respondents in the next year
- Metaverse tops the charts as the most hyped emerging technology of today with two in three votes agreeing

This year’s Annual Industry Survey kicks off by gauging the respondents’ views on the industry’s landscape. This section aims to evaluate overall business performance over the course of the year, while also thinking ahead and measuring the outlook for 2023. It further seeks to investigate the industry’s COVID-19 recovery, along with priority investment areas and potential threats to businesses.

RESPONDENTS’ BACKGROUND

Before we delve into our industry professionals’ views, let us take a closer look at the profiles of those who took part in our survey between September and October. Looking at the regional spread, more than two fifths (41%) of respondents are based in Europe, followed by around a fifth (21%) from North America and another 18% from Asia/Asia Pacific.

The survey attracted responses from a host of industry segments with the largest group, a third of total respondents, coming from communications service providers (CSPs) who include mobile, fixed, and virtual operators (34%). This is followed by just over a fifth of respondents who work for hardware or software vendors (22%), while in third place are respondents from system integrator and consultancy type firms (20%).

With respect to respondents’ specific jobs, the largest group are C-level executives making up a quarter of all respondents (25%). Other top groups of respondents are mid-level

management (20%) and Sales and Marketing professionals (18%).

In terms of industry tenure, more than half (52%) of the respondents have at least 20 years of experience in the telecommunications industry, including two fifths (39%) with more than 25 years in the industry, making them indeed seasoned professionals. Meanwhile, 18% of the respondents have entered the industry in the past nine years, including 7% who entered the industry in the past five years, adding some fresh outside-in perspectives.

These demographics suggest the survey results can be read with a very high level of confidence as reflecting what is truly taking place across the industry and ecosystem, representing the views from a mix of mature and emerging markets, while also bringing in a mix of experienced and fresh outsider perspectives.

INDUSTRY LANDSCAPE

Shifting our attention to the results on the industry’s landscape, the overwhelming majority sees the

industry’s business performance of this year positively. Around two out of three (63%) respondents believe the industry’s performance has been either excellent (19%) or good (44%). Meanwhile about a quarter of the professionals surveyed say the performance has been average. **FIG 1.1**

When asked about the telecoms industry business prospect for next year, the industry professionals respond even more confidently. More than two thirds view the business outlook for 2023 as positive (69%), including about a third (31%) that believe the outlook to be very positive, while just under two in five see it as somewhat positive (38%). Meanwhile one in five (19%) view the outlook as neutral, 11% as somewhat negative, and only a very small fraction of respondents (2%) view the prospects of the industry in the next year as very negative. **FIG 1.2**

The expansion of networks and the rollout of new services, both in the fixed and mobile sector, may well be the underlying reasons for such promising views on the prospect of the industry in 2023.



Figure 1.1: Business Performance of the Telecoms Industry 2022
How would you describe the telecoms industry’s overall business performance so far in 2022?

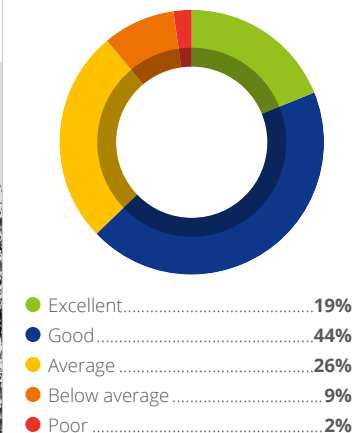
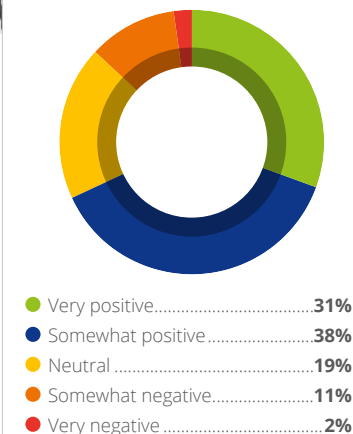


Figure 1.2: Telecoms Industry Business Outlook 2023
How do you feel about the telecoms industry’s business outlook for 2023?



“MORE THAN TWO THIRDS VIEW THE BUSINESS OUTLOOK FOR 2023 AS POSITIVE, INCLUDING ABOUT A THIRD OF RESPONDENTS THAT BELIEVE THE OUTLOOK TO BE VERY POSITIVE.”

The next chapters of the report delve further into the views of our respondents on some of the potential underlying drivers for these outlooks. The impact of 5G standalone core on wider 5G adoption, BSS monetisation to support new service models, and the role of video as part of the telecoms business are worth noting here.

Looking into how the industry professionals view a post-pandemic world, we found that the respondents are cautiously optimistic. Nearly half (48%) believe the telecoms industry will either bounce back stronger than pre-Covid-19 years, driven by pent-up demand (19%) or that the post-pandemic view will be mostly business as usual seeing as the industry deftly adapted to the changing demand during Covid-19 (29%).

Further, under a third of respondents (30%) feel we already live in a post-pandemic world but also agree that there is an ongoing supply chain crisis impacting the telecoms industry heavily. Additionally, a smaller portion of respondents (16%), yet still a significant number, believe our world will not fully come back to pre-Covid-19 "normal" in the next two years, and neither will the telecoms industry.

Against this backdrop, we further investigated which areas the industry professionals and their companies view as likely priority investment areas in the upcoming year.

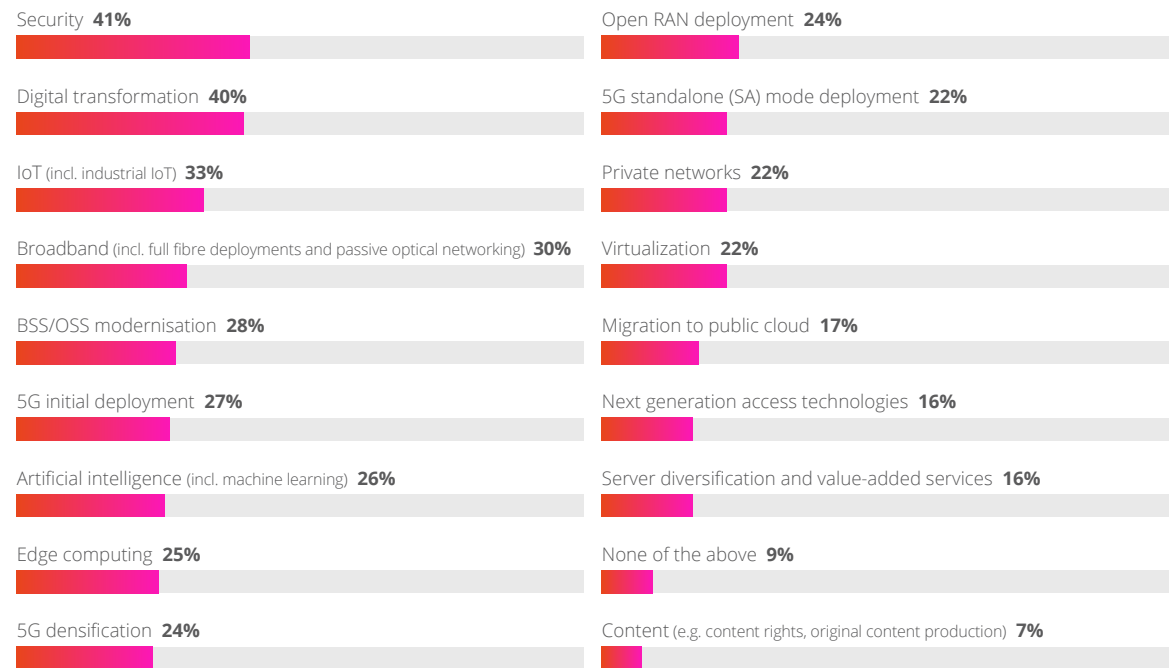
Among the top five priority investment areas are security (41%), Digital Transformation (40%), Internet of Things (IoT) including industrial IoT (33%), Broadband (including full Fibre deployments and Passive Optical Networking) (30%), and BSS/OSS modernisation (28%). **FIG 1.3** None of these should be particularly surprising for the following reasons.

Firstly, in terms of security, the industry has seen an accelerated increase in the number of cyberattacks and threats in recent years. Examples include attacks on tier 1 operators such as T-Mobile US and Optus in Australia. Such cases have resulted in data breaches, theft and ransom, regulatory liability and more. Adding to that the shift in consumer behaviour, the growth of connected devices, an increase in remote working, geopolitical tensions, and the Russian invasion of Ukraine combined all have created the perfect storm for cybercriminals to get more active. As such, it is not only sensible but imperative for telcos to prioritise and invest in security to protect their networks and customers (both consumer and enterprise customers).

Secondly, Digital Transformation (including telco cloud) along with BSS modernisation are key drivers in the journey to a platform-based 5G services era, while improving telcos' internal inefficiencies and ensuring their networks can monetise new service capabilities. As such, those

Figure 1.3: Company Priority Investment Areas 2023

Which of the following are likely to be priority investment areas for your company in 2023? (Select all that apply.)



who are keen to engage with new customer segments will likely shift their focus onto these two investment areas.

Thirdly, the IoT ecosystem and value chain continues to evolve. Some analyst forecasts see the market size reach around \$2,400bn towards the end of the decade. As such, there is also no surprise to see IoT, including industrial IoT, among the top three telco industry priority investment areas for 2023 in our survey.

Finally, full fibre deployments and passive optical networks, while they serve premises directly, are also relevant for 5G backhaul. Many in the industry also consider full fibre rollouts as an inevitable switch as was the move from analogue to digital. Consequently, there are a number of government incentives and large private sector investments for deployments. There is also a continued and an unrelenting demand for high quality, resilient, and high-capacity connectivity. While the capacity demand had already

reached our societies prior to 2020, the pandemic further highlighted the relevance of such networks as people and economies heavily leaned on high-capacity broadband networks.

Emerging technologies or services can make the headlines very early on at a conceptual stage and prior to any research and development efforts. Some are overhyped and met with scepticism while others are viewed as pioneering and their ROI is immediately compelling.

As such, we asked our respondents to share their views on a host of technologies currently making the headlines.

We found a clear consensus among our respondents with two thirds (66%) of industry's votes stating the Metaverse is the most overhyped emerging service or technology today. Metaverse is a decentralised online universe which aims to merge multiple virtual worlds together with the physical world. The chapter focusing on Digital

Transformation in this report also looks at the commercial aspect of this emerging technology. But judging by these results, and with the innovation phase yet to be triggered, it is clear that the ROI remains un compelling to our industry professionals.

A distant second, yet still a significant share with 38%, Artificial Intelligence (including Machine Learning) is viewed as the second most hyped technology presented. In the absence of the Metaverse in our survey last year, AL

“ON THE WHOLE, THE RESULTS CREATE A POSITIVE AND HOPEFUL BACKDROP, BE IT VIEWS ON THE INDUSTRY'S PERFORMANCE OF THIS PASSING YEAR, THE PROSPECTS FOR THE UPCOMING YEAR, OR THE COVID-19 RESPONSE-ADAPTATION-RECOVERY.”

and ML topped the ranks of overhyped emerging technologies in 2021 (also with 38%). Our Broadband Service Management chapter of this report further analyses several aspects of service automation – driven by AI and ML – and digs deeper into barriers to adoption. Suffice it to say that these results indicate that AI and ML remain hotly debated subjects with lingering uncertainties among telecom professionals. **FIG 1.4**

With architectural strategies of public and private cloud expanded in recent years, we investigated what best represents the views of our respondents on embracing public versus private cloud. The industry professionals predominantly agree there are security concerns over migrating telco functions to the public cloud (81%), including 44% who view security as their biggest concern with moving to public cloud and another 37% who find it hard to make the business case for public cloud as private cloud remains key in addressing security issues, meaning the efficiency savings are not as achievable when IT and network run over the two cloud types. Meanwhile, another 32% of votes flag it as very important that applications can run on all versions of public cloud and are portable among cloud vendors to avoid vendor lock-in.

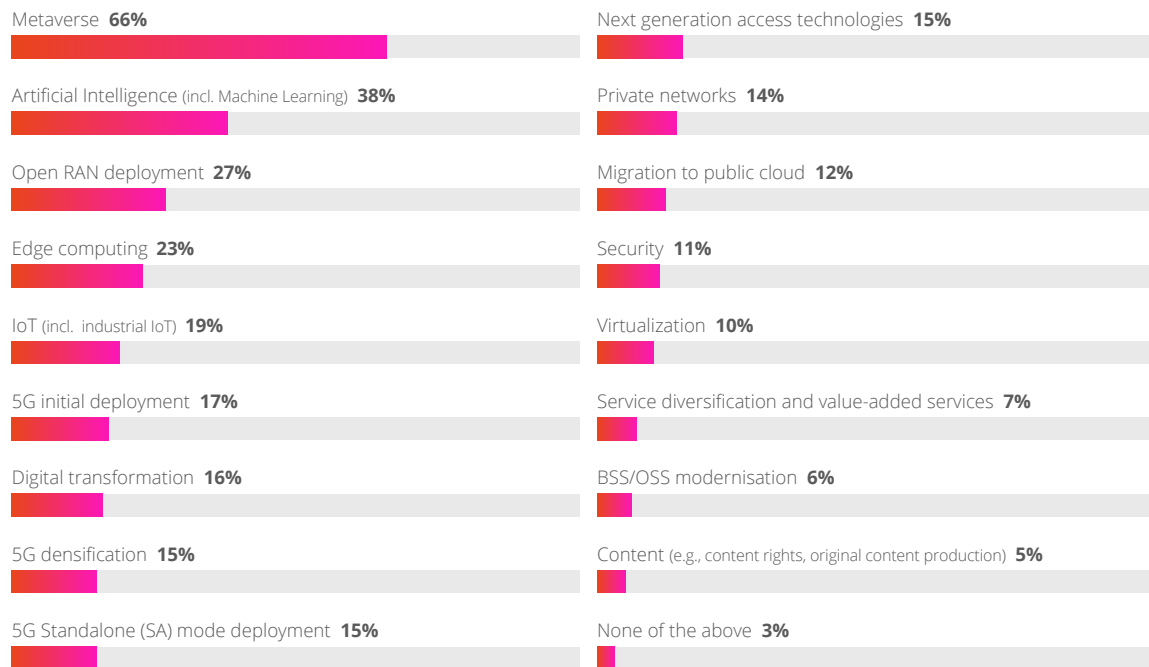
These results are not surprising given the latest backlash from operators against public cloud providers. With security and data sovereignty high

on the agenda, initiatives such as Sylva also highlight the importance of alternative, interoperable and open-source alternative solutions to telecom operators.

Further, we aimed to investigate what the industry views as the biggest potential threat to their organisations' long term business success. More than four in five responses (82%) touch upon pricing, profit margins and expenses, including 48% stating the greatest potential threat to their business success is the increased pressure to lower prices and profit margins and another 34% who view the inability to lower operating expenses as the greatest potential threat. Finally, 31% believe failure to roll out new technologies fast enough poses the greatest potential threat to their company's long term business success.

On the whole, the results create a positive and hopeful backdrop, be it views on the industry's performance of this passing year, the prospects for the upcoming year, or the Covid-19 response-adaptation-recovery. In the following sections of this report, we will dig deeper into the impact of core mobile networks on wider adoption, the transition to increased network efficiency, operational automation, sourcing new revenue streams and monetisation strategies, video content as part of the telecom business, entering new enterprise sectors, and the adoption of open source. ■

Figure 1.4: Most Overhyped Emerging Services or Technologies
What are the most overhyped emerging services or technologies today? (Select all that apply.)



5G

KEY TAKEAWAYS:

- The majority of respondents believe 5G standalone core will have a materially favourable effect on the adoption of 5G
- While network equipment and costs are seen as the biggest key challenge for deploying standalone 5G, nearly two thirds of respondents see generating new revenue streams from new 5G use cases as the most promising way to recoup 5G investments
- If savings of 36% of TCO over five years were conceivable, more than three in five respondents would deploy 5G core within the next six months to two years

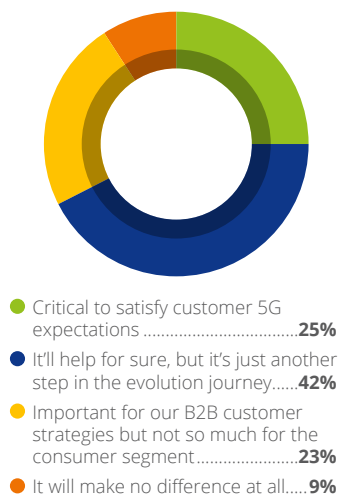
MAVENIR

About Mavenir

Mavenir is building the future of networks and pioneering advanced technology, focusing on the vision of a single, software-based automated network that runs on any cloud. As the industry's only end-to-end, cloud-native network software provider, Mavenir is transforming the way the world connects, accelerating software network transformation for 250+ Communications Service Providers in over 120 countries, which serve more than 50% of the world's subscribers.

A key insight from the 5G section of this year’s telecoms industry survey concerns the costs associated with the deployment of 5G SA core and how it is impacting deployment status. Most respondents agree faster go-to-market moves are possible, if a saving of around a third of the anticipated TCO, over five years, could be achieved. Yet, migration to a 5G core is inevitable if CSPs wish to roll out new services and leverage new revenue streams. In view of these findings, this section explores challenges and opportunities to recoup 5G SA investments.

Figure 2.1: The Relevance of 5G SA Core in 5G Adoption
How important is 5G SA Core in the adoption of 5G?



Close to 80 countries have already deployed commercial 5G networks, reaching nearly one billion subscribers in the third quarter of 2022, according to research house Omdia. As the fastest adopted generation of all mobile technologies continues to grow, we investigate the progress made on standalone (SA) core.

The migration to 5G SA – i.e., 5G radio using a 5G core network rather than Evolved Packet Core (EPC) – is just beginning to take shape as we exit the third year of commercial 5G. To date, a mere 10% of network launches constitute 5G SA, according to Omdia. Meanwhile on the device side more than half of all 5G announced devices are now becoming 5G SA compatible, according to Ericsson’s 2022 Mobility Report, creating a fostering environment for operators to accelerate 5G core deployments.

Against this backdrop, it is not surprising that the majority of respondents believe 5G standalone core will have a materially favourable

effect on the adoption of 5G, including two in five who view 5G SA core widely as ‘helpful’ (42%) in the evolutionary journey to the adoption and wider uptake of 5G **FIG 2.1**. This, combined with the growing number of SA-compatible handsets available on markets, can further support the subscriber migration to 5G SA.

Nonetheless, 5G SA is not viewed by all as the golden bullet for wider adoption. A mere quarter of respondents (25%) see 5G SA core as ‘critical’ to satisfy customer expectations, while, under a quarter of respondents (23%) see 5G SA core as more relevant for the

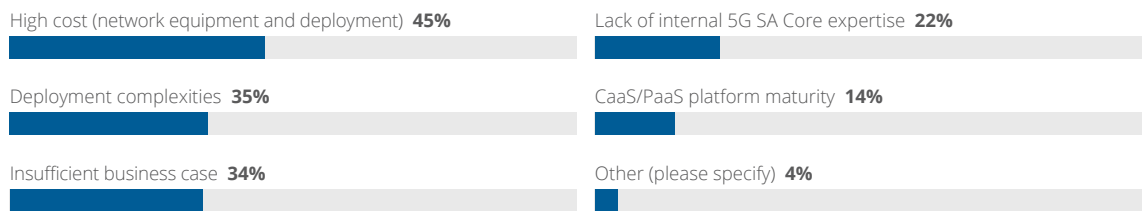
‘B2B customer strategies’, than the consumer segment **FIG 2.1**. The enterprise segment has often been cited as the segment where ‘real’ 5G can enable operators maximise value. However, considerations particularly for smaller enterprises in this segment should include greater clarity over measurable benefits beyond latency and bandwidth.

Capabilities unleashed by 5G SA core comprise of ultra-reliable low latency communication (URLLC), network slicing, and mobile edge computing (MEC), all contributing to the much-anticipated value 5G is expected to bring for the digitalisation of large

enterprises. These are often believed to bring CSPs further new business opportunities. Yet, the low ratio of SA network rollouts compared to NSA rollouts demands an investigation into the key challenges the industry faces in the migration to 5G SA core.

Here, ‘high cost’, both in network equipment and deployment, ranks as the most frequently selected key challenge with 45% **FIG 2.2**. With operators’ balance between capex and revenue somewhat unhinged, investments have remained high while revenues predominantly flat in the past decade.

Figure 2.2: Key Challenges in Deploying 5G SA Core
What are the key challenges in deploying 5G SA Core? (Pick the most significant two)



As such, it is unsurprising to see high costs ranking the top of this chart. This key challenge could be further exacerbated by the restrictions set in several national policies with regard to the banning of Chinese vendors in 5G core, thus driving down the selection among traditional vendors to less than a handful. Meanwhile, other challenges in deploying 5G SA core include deployment complexities and a lack of business case (35% and 34%, respectively).

Understanding these challenges helps uncover ways to recoup such heavy investments. With that, the long-debated notion of 'generate new revenue streams from new 5G use cases' is once more brought to the forefront as by far the most promising

way to recoup 5G network investments according to the respondents with more than 3 in five votes (61%). Further, in a distant a third of votes (34%) have gone to adopting cloud-native and end-to-end software, followed by moving to open and multi-vendor architectures in the core (29%) and implementing CI/CD, and other automation best-practices to reduce overall OpEx. **Fig 2.3**

Considering those new revenue streams, this survey further investigated which specific use cases the industry plans to, or is already, offering. While somewhat of a mixed bag, 5G enterprise and private networks topped the ranks as the most important use case (27%). A key business driver for 5G

Figure 2.3: Most Promising Way to Recoup 5G Network Infrastructure Investments
What is the most promising way to recoup the investment on deploying 5G network infrastructure? (Pick up to 3)

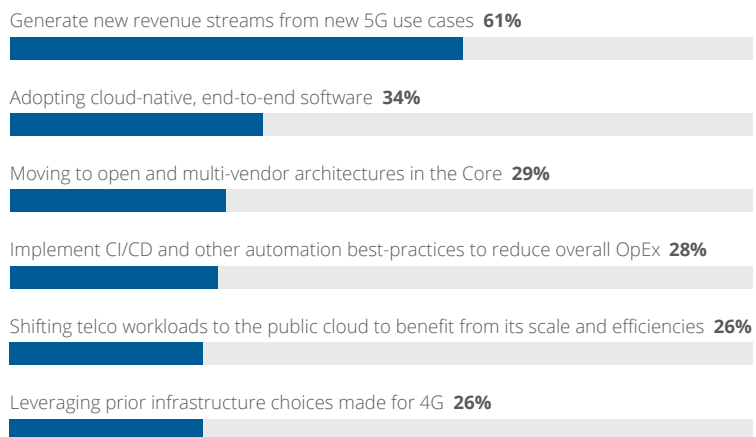
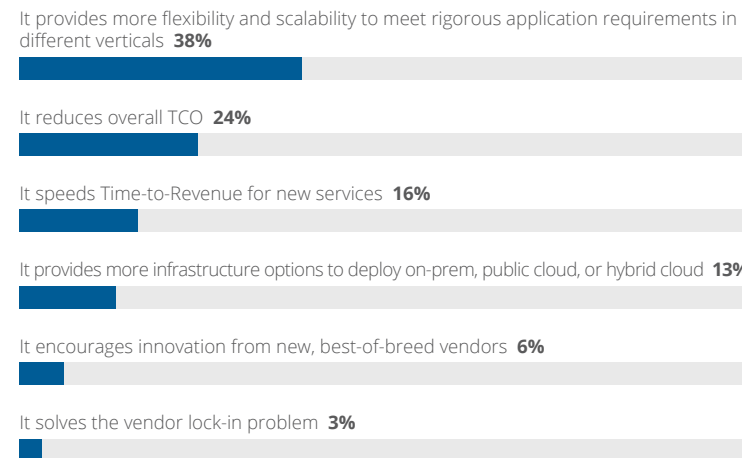


Figure 2.4: Reasons to Implement 5G SA Cloud-Native Architecture
Considering the 5G use cases you chose in the previous question, what is the most important reason to implement 5G SA cloud-native architecture? (Rank in order of importance)



private networks is the belief it can support large enterprises in their journey to digitisation. It is worth noting that this category of use cases was predominantly selected by hardware and software vendors with more than a third of its respondents while a quarter were from a system integration background.

Data gathered by Omdia further confirms these findings as competition in the private networks market is flying high with fewer recorded deals following the classic telco-managed business model. An increasing number of vendors and alternative players, including enterprises themselves, are taking the lead. This new model

could have been further reinforced especially by regulatory enablement such as enterprise-reserved spectrum allocations during 5G bids in some parts of the world.

Other use cases being offered, or planned to do so, include migrating or upgrading of existing customers in the consumer segment to 5G (22%). This was narrowly followed by dedicated network slices for different use cases (21%) and Fixed Wireless Access (FWA) offerings (19%). In a further distance, connectivity for

massive IoT was seen as the least promising use case presented with (12%).

When asked to rank the most important reason to implement 5G SA cloud-native architecture based on the above use cases selected, flexibility and scalability to meet rigorous application requirements in different verticals is the most compelling reason for nearly two in five respondents (38%). Meanwhile, a quarter of respondents (24%) believe it will reduce the overall total cost of ownership (TCO) **FIG 2.4**.

“MOST RESPONDENTS AGREE FASTER GO-TO-MARKET MOVES ARE POSSIBLE, IF A SAVING OF AROUND A THIRD OF THE ANTICIPATED TCO, OVER FIVE YEARS, COULD BE ACHIEVED.”

Further, as 5G core can utilise a cloud-native network architecture, it enables service-based network exposure from the core through to the edge and directly to enterprises, while operating in a more agile and more efficient way than non-standalone core and without the need for intermediary software. The exposure of networks and assets in return, can enable CSPs to diversify their services, paving the way for new ways of 5G monetisation. As such, speeding up ‘Time-to-Revenue for new services’ was regarded as the third most important reason (16%) to implement 5G SA cloud-native architecture.

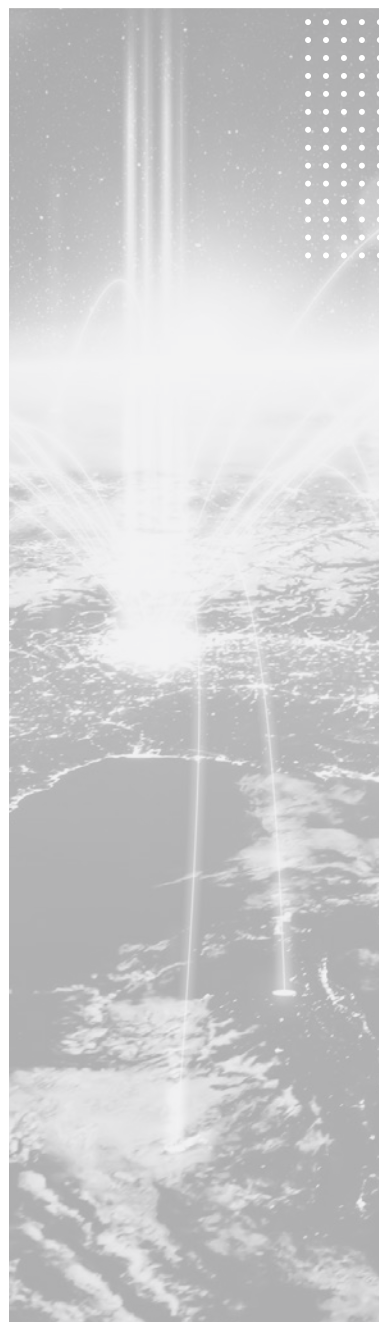
Figure 2.5: Speed of 5G SA Deployment with Potential of 36% TCO Saving

If you could save 36% TCO over 5 years, how quickly would you like to move to 5G SA deployments?



- Immediately7%
- Within the next 6-12 months.....32%
- Within the next 1-2 years35%
- Not before 202514%
- Not likely in our plans.....12%

Evidently, to better serve verticals and the enterprise segment, CSPs need to overcome the additional cost and barriers associated with the deployment of 5G SA in the first place. To further understand how much saving is needed in the deployment of 5G SA, our respondents were asked to rate how quickly they would deploy SA core if they could save 36% on their TCO over five years. An overwhelming 67%, or more than two thirds of respondents, would deploy 5G core within the next six months to two years, with nearly a third (32%) likely to act faster and rollout deployments in the next 6-12 months if they could make such a saving of about a third of their currently estimated TCO **FIG 2.5** ■



SPONSOR'S COMMENT

While the key business drivers for 5G SA Core may vary across CSPs, it is essential that CSPs choose the right 5G network architecture to justify their investments and enable new 5G revenue streams. Like any new-G network evolution, proper planning, timing, and business case evaluation are required. The same is true for 5G SA Core. In fact, one could argue that for 5G this is more important than any other-G evolution.

5G is not just about satisfying existing consumer demands, but also enabling easy-to-deploy revenue-generating enterprise services, cloud-native adaptation, and implementation of cost-effective operations. The new 5G SA Core should be:

- Truly cloud-native
- Able to scale down to meet small footprint enterprise use cases
- Able to easily scale-up to support growing consumer throughput demands
- Cloud-agnostic so it can be deployed on any private or public cloud
- Able to key cloud native priceless when it comes to ease of deployment, automation, CI/CD and dynamic network slicing in order to reduce overall operational overhead

As an added benefit, a 5G SA core that provides support for 2G/3G, 4G, and 5G NSA using the same converged core will provide CSPs with added CapEx and OpEx savings to support their overall TCO investment as they modernize their network a cloud-native 5G.

In summary, the real value of a 5G SA Core goes beyond the consumer model - new technology, revenue, and operational possibilities will shape the future of a CSP's business and translate into a competitive advantage by future-proofing the network.

DIGITAL TRANSFORMATION

KEY TAKEAWAYS:

- A great majority of our industry professionals report that they are now focused on improving their internal efficiencies, including cost savings
- More than half of respondents are moving to private or public cloud – but cost and organisational uncertainties remain key considerations
- Around one in three respondents report they have many service concepts to monetise as their capabilities evolve, but they find configuration and testing of services challenging



About Amdocs

Amdocs helps those who build the future to make it amazing. With our market-leading portfolio of software products and services, we unlock our customers' innovative potential, empowering them to provide next generation communication and media experiences for both the individual end user and enterprise customers. Our 31,000 employees around the globe are here to accelerate service providers' migration to the cloud, enable them to differentiate in the 5G era and digitalize and automate their operations. Listed on the NASDAQ Global Select Market, Amdocs had revenue of \$4.3 billion in fiscal 2021.

Across the industry, organisations have generally set off on their journey to transition to more virtualised and cloud-based digital businesses. This is often believed to provide long term financial growth and increased efficiencies. Such digital optimisation and business model innovations are often associated with telcos' digital transformation journeys.

This section of the survey aimed to assess both the strategic focus and efforts already undertaken by telecoms industry stakeholders towards their digital transformation journey. Many telecom businesses are already investing in next-generation networks (NGNs), including for the expansion of 5G coverage, the rollout of SA core, as well as the deployment of other NGNs such as Edge Computing and telco cloud across many markets. To this end, it makes sense to start off with gauging organisations' priorities with respect to internal efficiencies and to the launch of new digital services.

A great majority of our industry professionals (84%) report that they are now focused on improving their internal efficiencies, including nearly half (45%) who are mostly looking to digitise their operations to save on costs and nearly two in five (39%) who are primarily focused on transforming

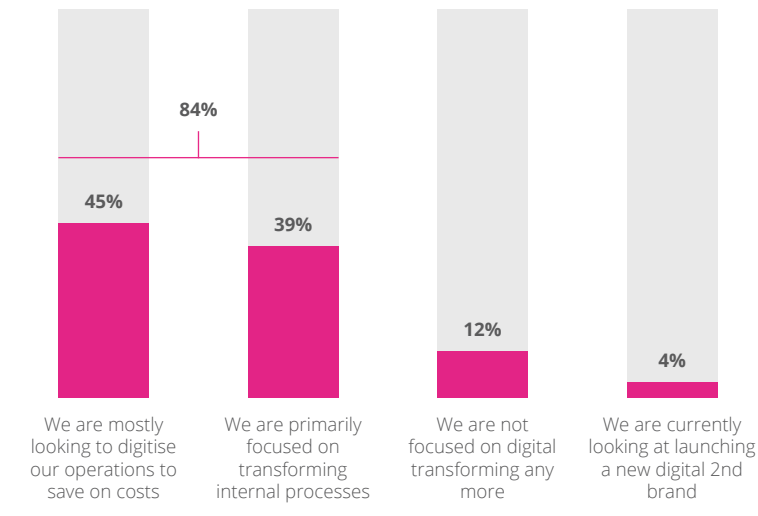
their internal processes. Few (12%) are moving their focus away from digital transformation all together, while only a very small fraction of respondents is looking to launch new digital second brands (4%). **FIG 3.1**

The metaverse, as explained in the Industry Landscape section of this report, is the idea of a merged world which is borderless and connects several virtual worlds and the physical world. According to a Gartner forecast, by 2026 nearly a third of organisations (30%) will have products and services ready for the metaverse, while a quarter of people will be spending an hour of their day in the metaverse, be it for entertainment, education, work, or regular chores.

Many industry professionals argue the metaverse is the most hyped emerging technology today. Such forecasts to some extent align with the responses to our survey. Nearly a quarter of

Figure 3.1: Focus of Digital Transformation Strategy

Is your digital transformation strategy mostly focused on improving internal efficiencies or launching new digital services?

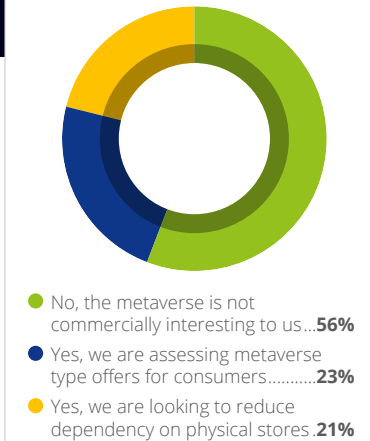


respondents (23%) are assessing metaverse type of offers for consumers already. Meanwhile, another one in five of respondents (21%) are looking into ways of reducing their dependency on physical stores. However, this also does leave us with more than half of respondents (56%) who do not view the metaverse as currently being commercially interesting, creating a divided view on whether the

metaverse will be part of a telco's digital transformation journey. **FIG 3.2**

Aiming to measure the overall digital transformation achievements telecom businesses have gained, we asked the respondents how they would rate their successes. There is an overarching consensus with two thirds of respondents (66%) agreeing that the digital transformation efforts of

Figure 3.2: Utilising the Metaverse
Is your business looking at ways to utilise the metaverse in its digital transformation journey?



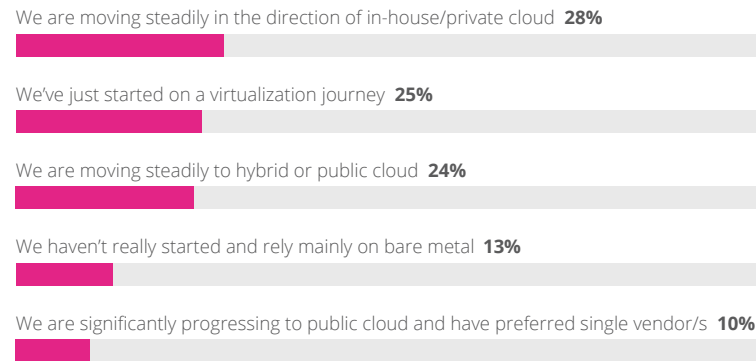
their businesses have been successful. This includes more than a third (35%) who believe they are more competitive now that they are viewed as a digital brand and almost another third of respondents (31%) who agree their efforts have made a huge difference to internal operations. Meanwhile, a quarter of respondents (25%) have not seen any change, be it positive or negative.

As already alluded to, digital transformation is a journey involving continuous innovation while responding to change, rather than a single destination. As such, it is safe to assume it will likely continue for many years to come with every technology modernisation effort, every new way of improved operational and financial efficiency introduced, and every time a new digital business model is innovated. Currently the journey to cloudification of networks and workloads as well as virtualisation are frequently regarded as part of this journey, especially in the context of 5G SA core and the new services the fifth generation of mobile technology can enable.

Its rapid rollout, and the fast adoption already seen, show telecom operators' efforts are achieving great strides. Previous research by Telecoms.com has shown competitive pressure to offer new 5G services as the strongest driver to transform networks. With 5G SA core able to utilise a cloud-native network architecture, the journey to the cloud seems the next logical step. Yet it appears there is little consensus among stakeholders regarding the approaches towards this transition, while many also remain at early stages of their journey to the cloud.

More than half of respondents are moving either to private or public cloud. This includes more than a quarter (28%) who are moving steadily in the direction of in-house/private cloud, meanwhile

Figure 3.3: The Journey to the Cloud
On the journey to Cloud, how would you rate the transformation of your business?



less than a quarter of respondents (23%) are moving steadily to hybrid or public cloud. Meanwhile, yet another quarter of industry professionals report they have just started on their virtualisation journey. A mere one in ten state they are significantly progressing to public cloud and prefer working with a single vendor. A small but not insignificant group also report not having really embarked on the journey to the cloud at all and continue to mainly rely on bare metal. **FIG 3.3**

Some industry professionals have argued that cloud-native environments can bring many benefits including lowering costs in the long term, accelerating innovation, and increasing efficiency gains. But the slow rate of migration and the fragmentation in approaches seen above, makes for a compelling reason

to investigate the main barriers to progression with the cloud.

The industry professionals responding to our survey believe the top two barriers to cloud progression are sub-optimal organisational capabilities (30%) and the high cost of change, i.e., the initial transition costs (27%). Senior management reluctance and their lack of buy-in is also considered a key barrier by nearly a quarter of respondents (23%). One in five respondents (20%) also believe uncertainties related to vendor support are hampering their cloud progression. **FIG 3.4**

Monetising 5G and other next-generation networks can be complex and challenging. For instance, we often hear and read about telcos' 5G readiness. This notion of network readiness traditionally has included the network, including the services that can sit on top, and device readiness. Yet the onset of network transformation is taking the industry a step further. Strategies such as network or service exposure – opening up network capabilities for the ecosystem and partners to innovate on – and modernization of the billing systems so new revenue models can be supported, are examples of how telcos can prepare to leverage new network capabilities.

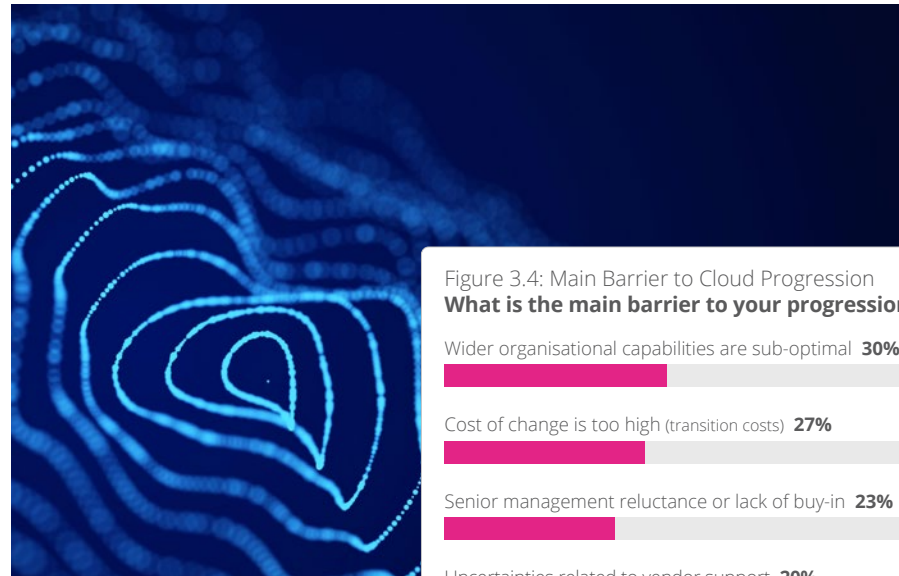


Figure 3.4: Main Barrier to Cloud Progression
What is the main barrier to your progression with Cloud?

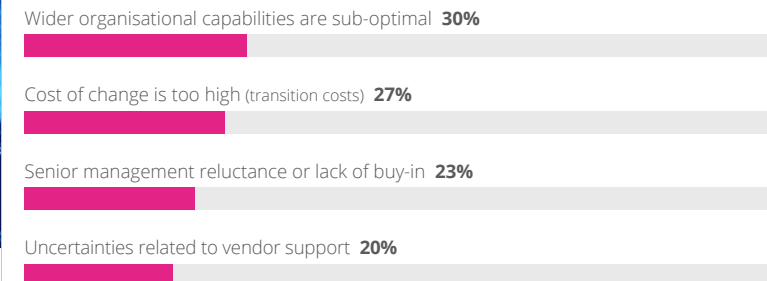


Figure 3.5: Monetisation of Evolving Capabilities
In terms of monetisation of evolving capabilities...

We have lots of service concepts but configuration and testing of services are challenging **36%**

Configuration and testing of services are working well but we cannot configure our monetization platform/s **26%**

We are ready to monetize a wide range of upcoming services, whatever they might be **26%**

Our monetization tools are handling whatever upcoming services we provide right now - but we are constrained when it comes to future services **12%**

As such, in terms of monetisation of these evolving telco capabilities, we aimed to understand the industry professionals' progress and evaluate what challenges they are facing in this journey. Around one in three respondents (36%) report they have many service concepts, but they find configuration and testing of services challenging. Further, around a quarter of respondents (26%) report configuration and testing of services are working well yet they cannot configure their monetisation platform(s).

The good news is that at least a quarter of industry professionals are ready to monetise a wide range of services (26%). Meanwhile, only a smaller group of respondents (12%) find their monetisation tools are handling whatever services they provide right now, but even those are constrained when it comes to future services. **FIG 3.5**

While traditionally networks have been built to serve as the service itself, NGNs are now being built with platform-based business models in mind, enabling communication service providers to add more value for their end-users. Network configuration and testing of systems, including billing and operating systems, are a crucial step in the race to enter new verticals, to partner, and to win new customer segments. The success of services and capabilities – such as network-slicing or SLA-based service delivery which can serve high-value vertical customers – may well depend on the ability to monetise evolving capabilities. ■

SPONSOR'S COMMENT

2022 is likely to be seen as a year of enormous transition. Geopolitical uncertainties combined with continued emergence from the global pandemic have meant that pent-up consumer as well as rapidly evolving enterprise requirements have placed even greater expectations on 5G. Challenges as well as opportunities related to 5G can only be expected to expand further in 2023. It is unsurprising to us then that such internal focus on digital transformation has continued to dominate **FIG 3.1** as service providers build their 5G capabilities for the coming years. The Metaverse remains of interest in terms of its disruptive capabilities **FIG 3.2** but is perhaps not as significant as the huge internal efforts and challenges that still need to be overcome by service providers to derive broader benefits from cloud **FIG 3.4**.

That journey to cloud is still at an early stage for many **FIG 3.3** and those internal considerations and challenges can be expected for some time. It seems choosing the right, agnostic partner such as Amdocs is more critical than ever in terms of a more optimal movement to cloud. Not unrelatedly, as 5G continues to evolve, it seems there are more service concepts and opportunities than ever **FIG 3.5** but optimizing service diversity end-to-end to include monetization seems set to be a growing challenge. One that we at Amdocs know well and are resolving daily for leading-edge service providers.

BSS MONETISATION

KEY TAKEAWAYS:

- One in four respondents will upgrade existing BSS and charging stack to support new use cases for enterprise and B2B2X.
- Close to half of respondents reveal one of three BSS modernisation strategies
- More than half report their BSS stacks can support multiple lines of business, most commonly within a single BSS stack

Optiva

About Optiva

Telecom operators and MVNOs worldwide fast-track their monetization innovation using Optiva 5G-ready BSS products. Our solutions deliver a converged digital experience that accelerates new monetization opportunities, including 5G use cases, digital brands, MVNO/Es, and partner ecosystems.

Our revolutionary fast-track deployment accelerates operators' business velocity for faster launch of offerings, flexible service bundling, new commercial models, and time to revenue — all while ensuring a superb customer experience. Optiva products are available on the private and public cloud in Google and Microsoft Azure marketplace, architected with cloud technologies, including DevOps, automation, AI, ML, open APIs, and open architecture.

A leading provider of mission-critical, cloud-native monetization and revenue management software since 1999, Optiva has a proven track record of deploying large-scale platforms for operators globally both on public and private clouds as well as on-premise. Our BSS solutions are battle-tested, integrating 5G technology, converged charging, and cloud economics, so operators achieve profitable growth, agile innovation, and business success.

The onset of a new technology, such as a new mobile generation, is often regarded as a time to review telcos' support systems which operate their service delivery and management infrastructure. As we enter another transformational phase of 5G, new charging mechanisms and strategies to exploit product capabilities can help telecom businesses with service scalability and efficiency. Monetisation through BSS, as such, becomes a key component of new-service onboarding, leveraging new revenue streams, and improved partner ecosystem management.

As an essential part of a business, Business Support Systems (BSS) enable CSP services while handling the management of multiple tools and applications including product management, order and revenue management, as well as being responsible for customer care and successful customer experiences.

Now with the scaling phase of 5G underway, we enter a pivotal moment requiring more effective service monetisation plans and new revenue stream prioritisation. These can be achieved through agile and flexible support systems. In most parts of the world, the telecom industry is shifting its focus from enabling 3G and 4G driven digital lifestyles to more 5G driven solutions including industry and enterprise partner ecosystem. This would require the enablement of partners to sell their own services along with elements of connectivity as an add on. For instance, when dedicated

network KPIs such as low latency or guaranteed speeds are added to a service subscription.

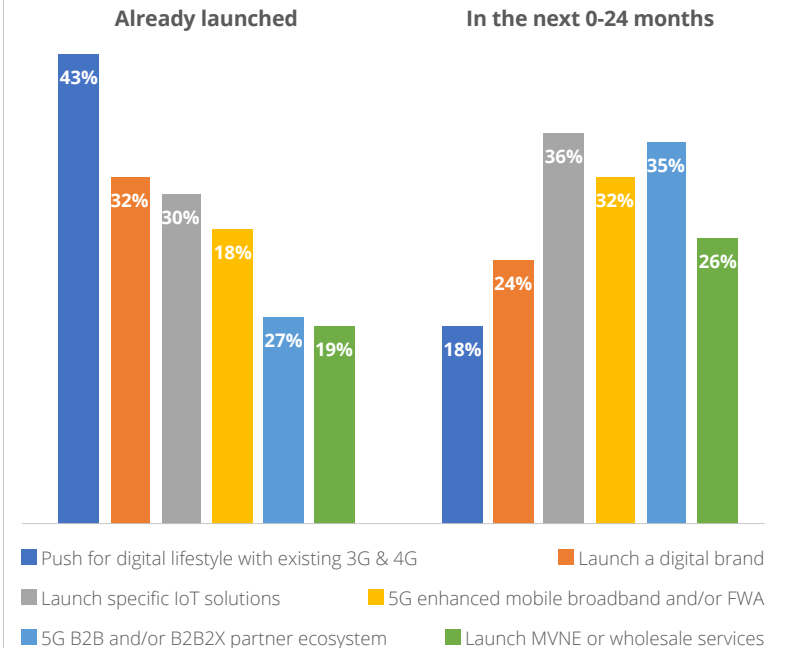
This shift in service focus is further demonstrated by the near symmetric U-shape of the chart in Figure 4.1, when comparing services already launched versus planning to launch in the next two years. While moderate in response volume, both 5G B2B and/or B2B2X partner ecosystem (35%) and the launch of specific IoT solutions (36%) are considered top priorities for respondents in the near term. Service providers might not be fully confident in their views towards generating revenue from partnership models the results highlight that they mostly understand defining and delivering end-to-end solutions to verticals demands partnerships across the ecosystem, be it with hyperscalers or otherwise.

Respondents also plan to launch 5G Enhanced Mobile Broadband



(eMBB) and/or FWA in the next two years, according to another third of responses (32%), while having already been launched by 27% of industry respondents to date. Lastly, a small growth is also shown in the plans and priorities for the launch of MVNE or wholesale services (26%) in the next two years, compared to activities in that space to date; these services also often encapsulate IoT connectivity **FIG 4.1**.

Figure 4.1: Plans and Priorities to Enable New Revenue Streams
What are your plans and priority to enable each of the following new revenue streams?

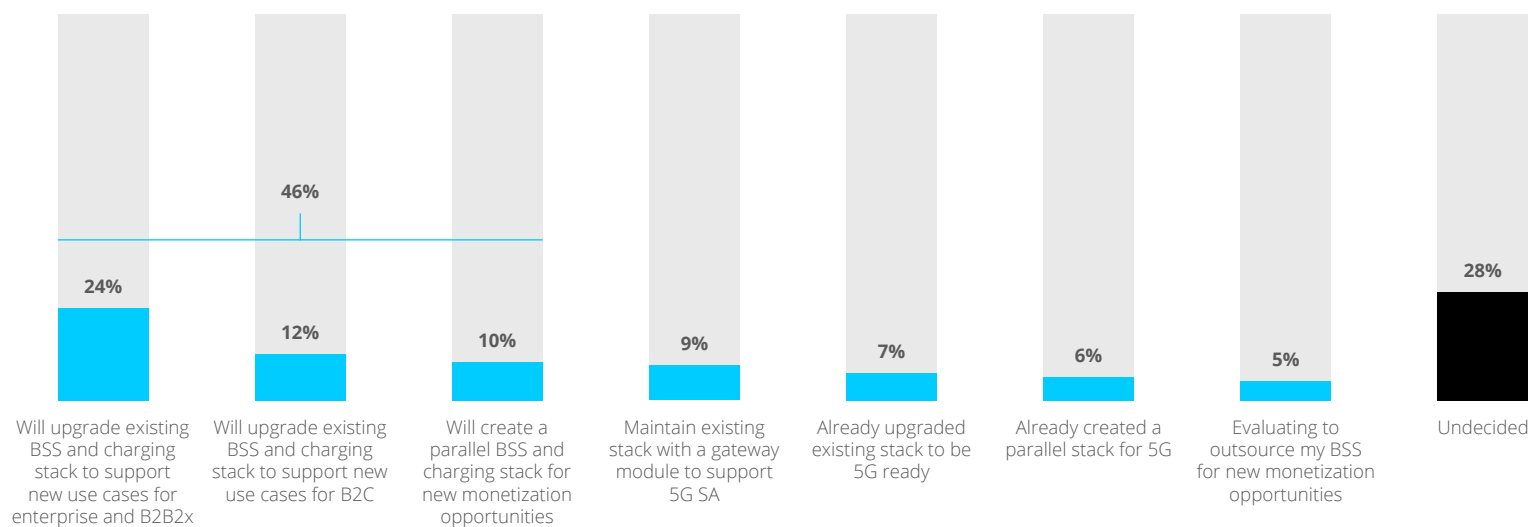


As the industry braces for a push to reap the benefits of 5G and is planning for new monetisation opportunities, it is important that service providers consider the modernisation of their existing BSS stacks and how this can support them harness new commercial opportunities.

While nearly a third of respondents (28%) are still on the fence, there is

generally a sense of planning among respondents with close to half (46%) revealing some strategies around BSS modernisation. These include plans to upgrade the existing BSS and charging stack to both support new use cases for enterprise and B2B2x (24%) and new use cases for B2C (12%), as well as to create a parallel BSS and charging stack for new monetization opportunities (10%) **FIG 4.2**.

Figure 4.2: Strategy for BSS Modernization & Monetization Opportunities
What is your strategy for BSS modernization and harnessing new monetization opportunities (e.g., support for 5G use cases)?



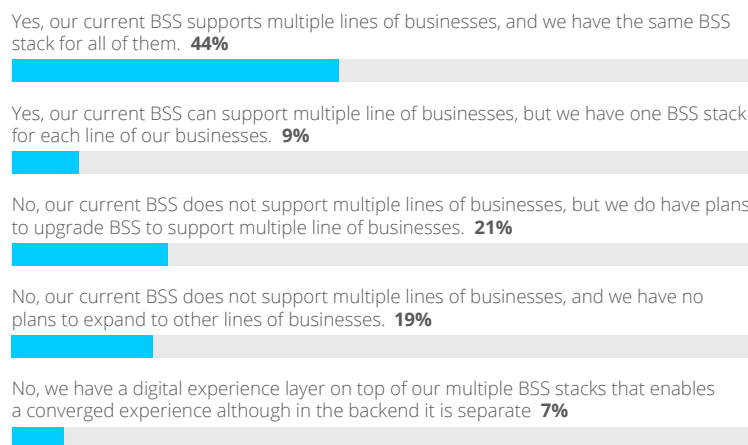
This sense of preparation is positive but not surprising given service providers nearly unanimously recognise the value 5G can bring to their revenue growth strategies, according to a 2021 study by TM Forum.

More specifically looking at features that can assist with monetising in the 5G market, our respondents viewed the ability to deliver a digital experience for the end customer as the most critical feature (23%), followed by creating a new partner ecosystem offering which would go beyond connectivity (21%) and the ability to push new products and upgrades at a fast speed (21%). Other features while considered very

important but seen as less critical are the ability to support new innovative 5G use cases for consumers (17%) and cloud-native and scalable to handle 5G traffic (14%).

Meanwhile, when planning to modernise BSS, the function respondents regard as a top priority is the digital layer, with functions such as product catalogue and order management across BSS systems (27%). Product and service catalogues, revenue management systems and service orchestration are mature applications that have also seen increase in revenue in the past two years, according to TM Forum research.

Figure 4.3: BSS Stack Ability to Support Multiple Lines of Business
Does your current BSS stack support multiple lines of businesses (fixed, mobile, broadband, etc.) in one stack?



Additionally, reflecting on fostering the ecosystem long term, nearly a quarter (24%) of respondents are also planning to prioritise the development of marketplace and partner management capabilities for their B2B business. Further, one in five respondents (20%), believe the convergence of all BSS stacks to be another important part of BSS modernisation.

The convergence of fixed and mobile broadband first gained momentum with the launch of 4G networks in the past decade and continues to grow. So-called multi-play offerings enabled consumers to combine their fixed and mobile service providers, as well as in some cases their entertainment products. Meanwhile, from the customer point of view, an effortless user interface (UI) when dealing with multiple products and services and regardless of channel used, has been considered as critical.

Now with the expansion of 5G, the notion of convergence becomes even more important as network assets evolve further with broader 5G capabilities. As such future-proofing business systems for multi-play services can be achieved through a BSS that supports multiple lines of businesses in one stack.

This is also echoed by the state of play among our respondents as more than half (53%) report their BSS stacks can support multiple lines of business, most commonly within a single BSS stack (44%) **FIG 4.3**.

While over two in five (21%) report they plan to upgrade their BSS stack to support multiple business lines, less than two in five (19%) disclose their current BSS does not support multiple lines of businesses while they also have no such intentions to expand to other lines of businesses.

As discussed earlier, enabling B2B2X and partner ecosystem offerings fell among the respondents' top priorities for new revenue streams. In terms of specific monetisation strategies for this segment, one third of respondents (33%) plan to introduce marketplace solutions and partner management capabilities to provide advanced services to enterprises.

Further, one in six respondents (16%) plan to partner with hyperscalers and provide connectivity services in their marketplace, while one in seven (14%) plan to partner with their BSS vendors for aggregated services, managing an ecosystem of partners and providing marketplace technology so they can focus on the front-end sale of services to their customers. Meanwhile, less than a third of respondents (29%) have no plans at all to enable B2B2X and for ecosystem partnerships in the near to midterm **FIG 4.4**.

Figure 4.4: BSS Monetization Strategy to Enable B2B2X & Partner Ecosystem Offerings

What is your BSS monetization strategy to enable B2B2x and partner ecosystem offerings?

We are planning to introduce marketplace solutions and partner management capabilities to provide advanced services to enterprises. **33%**

We are planning to partner with hyperscalers and provide connectivity services in their marketplaces. **16%**

We are planning to partner with our BSS vendors to have them aggregate services, manage an ecosystem of partners and provide marketplace technology while we front-end the selling of services to our customers. **14%**

We have already launched marketplace(s) for enterprises. **8%**

We have no plans to enable B2B2x and partner ecosystem in the next 24-36 months. **29%**

SPONSOR'S COMMENT

BSS solutions are accelerators for new monetization opportunities. Many CSPs are already embarking on the journey to modernize or replace them as they understand that legacy BSS solutions can be a hindrance to competing effectively in the evolving market and prevent operators from satisfying their subscribers' expectations.

With the rollout of 5G networks, a new breed of BSS solution is required. For many CSPs, though, BSS systems lag with outdated technology and capabilities, limiting them from supporting new use cases. Therefore, CSPs miss new monetization opportunities.

With the adoption of cloud capability, productization, and automation-based technology, CSPs experience the ability to experiment with new services in the consumer and B2B2X domain, which is forecasted as a major industry growth opportunity. This ability enables them to monetize their investments better and ensure their subscribers a truly digital experience.

CSPs understand they need to upgrade their BSS systems (if they have not already) to support a truly converged digital customer experience, new use cases, and flexibility in service creation and definitions. Upgrades also give operators the opportunity to generate new and more secure revenue streams by launching digital brands or MVNE platforms that utilize and monetize their network capacity.

The survey results validate our belief that digital experience, 5G, and developing partner ecosystems should dictate telcos' efforts. A future-ready BSS is critical for seizing these growth opportunities. Operators must assess and strategically determine their BSS stack strategy to ensure its readiness and capability to realize and accelerate growth.

BROADBAND SERVICE MANAGEMENT

KEY TAKEAWAYS:

- Legacy infrastructure is considered the largest barrier to automated zero-touch services
- A quarter of respondents use separate systems to provide access and manage devices at customer premises for their FTTx or FWA services
- More than two in five respondents use a centralized OSS across multiple access networks
- More than half of respondents report their operational and maintenance processes are only partially automated with their systems executing specific, repetitive tasks

incognito

About Incognito

Incognito Software Systems provides service orchestration software and services that help digital service providers manage the next-generation broadband experience. With over 30 years of industry experience, Incognito is at the forefront of innovation when it comes to automated broadband OSS solutions. Our productized platforms, spanning device management, service orchestration, and security, allow fixed broadband service providers to transform their operations and create new possibilities around fiber, cable, and mobile 5G/4G technologies.

Incognito has proven expertise with mission-critical solutions deployed in over 200 customers worldwide, with customers like Claro, Cox, Digicel, Globe Telecom, and Orange leveraging our solutions to fast-track the introduction of innovative broadband services and deliver a great customer experience. The company is a division of the Lumine Group, a portfolio of Constellation Software Inc., the largest independent software company in Canada. For more information about Incognito and our innovative solutions, visit www.incognito.com.



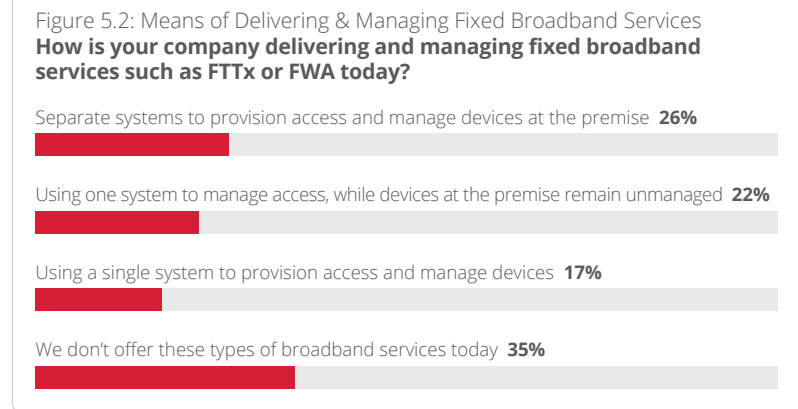
An increasing number of service providers are now investing in fibre to deliver next-generation services while also aiming to reduce operational costs and improve network performance. Yet, such network transformation can introduce new operational complexity impacting existing OSS, IT systems, and go-to-market and scaling speeds. This year's new survey category, Broadband Service Management, aims to investigate how the industry views new evolutions of service delivery and network automation.

Broadly speaking, zero-touch provisioning is the ability to conduct remote and automatic configurations. As part of service orchestration, we investigated the biggest challenges faced in achieving zero-touch broadband network resource and service management. There is strong agreement among industry professionals that legacy infrastructure is the largest barrier (50%) to automated zero-touch services. Siloed

operations across technologies are also believed to hamper zero-touch management substantially (40%), while the growing multi-vendor network environments are now identified as the third largest key challenge (33%).

Other challenges include the lack of substantial analytics or insights (31%) and manual incident processes and workflows (28%) **FIG 5.1**. Nonetheless, automating processes can be pivotal to service providers' agility and monetisation of their broadband services while satisfying the increased customer demand observed in recent years.

Digging further into service provisioning, we asked our respondents to review the ways in which they currently deliver and manage their fixed broadband services such as FTTx or FWA. While 65% of industry professionals offer FTTx or FWA today, their responses to delivery and management modes are somewhat of a mixed bag. Just over a quarter (26%) use separate systems to provide access and manage devices at the premise, followed by around one fifth (22%) using one system to manage access, while devices

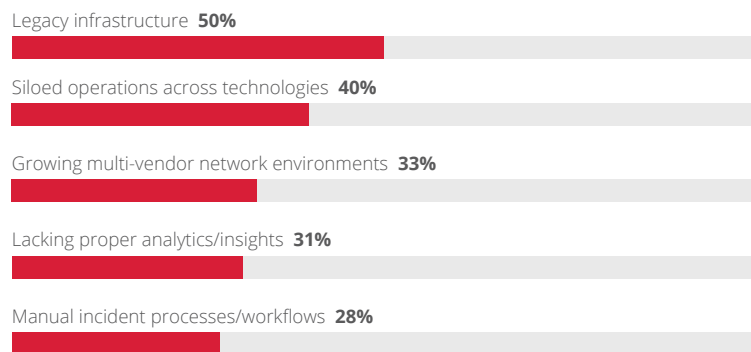


at the premise remain unmanaged. Meanwhile, fewer respondents (17%) use a single system to provide access and manage devices **FIG 5.2**.

The deployment of FTTx can be capex intensive depending on the location a service provider operates in. Thus, such broadband business models may rely more on network performance and the orchestration of service delivery across core and access networks. These results offer an opportunity for service providers to review their existing means of delivery and management for FTTx and also FWA.

A telco's operational support system (OSS) sits at the heart of the business, aiming to achieve efficiency, to provide insights into network performance, and to improve overall processes. OSS is also the tool that enables telecom businesses to innovate as they analyse data gathered to understand how their customers wish to use their services. Of course, there are always cost considerations for ripping out legacy OSS and replacing them, which perhaps calls for a more moderate and gradual transformation.

Figure 5.1: Key Challenges in Achieving Zero-Touch Broadband Network Resource and Service Management
What are the biggest challenges your company faces in achieving zero-touch broadband network resource and service management?
 (Select all that apply.)



As such, when asked about OSS strategies for managing broadband networks, which could include multiple services virtualised technologies and access technologies, more than half of respondents (51%) state their strategy is to operate on one of the three forms of separated systems. These include, plainly keeping operations separated (19%), using multiple OSS systems, with some spanning multiple access networks (18%), or maintaining separate systems across different access networks (14%).

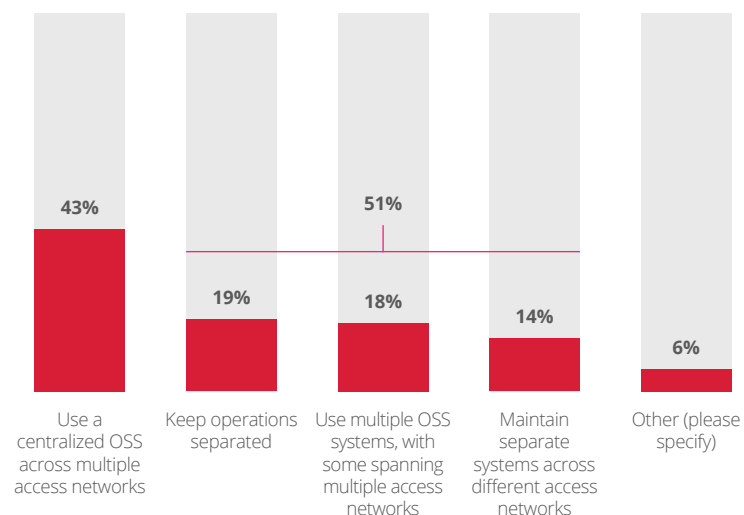
Nonetheless, there is also a fairly large portion of respondents (43%) that

do have a strategy in place to use a centralized OSS across multiple access networks **FIG 5.3**.

Customer insights, while they enable the innovation of new services, are also important when it comes to access network technology. We further investigated the ways the industry gains subscriber insights, while also managing and assuring fixed broadband service quality today. The results were split as no single strategy emerged as particularly dominant. Data collection and/or traps from vendor EMS/NMS (25%), data collection and/or traps using SNMP (24%) and Deep Packet



Figure 5.3: Means of Gaining Subscriber Insights
What is your company's OSS strategy for managing your broadband network, which may include multiple services, virtualized technologies, and access technologies?



Inspection (DPI) (24%) were among the three most common ways chosen.

In terms of ways to operationally address fraud and network security in broadband access to operationally secure customer devices such as cable modems, residential gateways, or CPEs, respondents most commonly use IT tools in network security (34%). Automated firmware updates to devices to minimize risk of breach (15%) and In-house built tool for scripts and/or queries from provisioning system (13%) are, respectively, the second and third most common ways to secure customer devices.

Other methods used include manual and reactive firmware updates to devices if we encounter a threat

“THESE RESULTS HIGHLIGHT AN OPPORTUNITY TO COMBINE DISPARATE UNITS INTO A SINGLE UNIFIED PLATFORM, WHILE TAKING ADVANTAGE OF AUTOMATION.”

(9%), and in-house built tool for scripts and/or queries IPv4 or IPv6 address lease information (8%). Meanwhile, about two in five respondents (21%) do not have any ways to operationally address fraud and security of customer devices today, however, at least a quarter of these report planning or considering doing so in the near term (12-18 months).

As already discussed further above, most respondents to this survey use separate systems to provide access and device management for their customers. Considering the capex intensity in this segment and its implications on the business models, we wanted to further understand how operational processes are managed for broadband services.

Figure 5.4: Automation of Operational Processes for Broadband Services
How much of your company's operational processes are currently automated for your broadband services?



When it comes to automation of operational processes, more than half of respondents (56%) report their operational and maintenance processes are only partially automated with their systems executing specific, repetitive tasks. Less than a third of respondents (27%) have a fully autonomous network or use a closed-loop automation **FIG 5.4**.

An increased demand in reliable network performance, and equally an increased demand in bandwidth from consumers, can act as catalysts to introduce changes or upgrades and, where relevant, converge IT systems such as operations in the back office. These results highlight an opportunity to combine disparate units into a single

unified platform, while taking advantage of automation. Converging multiple orchestration systems not only creates network automation to alleviate from manual executions but also provides a unified experience on the customer care interface.

In today's ever-changing broadband landscape, it is more important than ever to have a robust strategy in place for broadband service management. Closed-loop automation can be a key component of achieving proactive service assurance, vital to maintaining a high-level of user experience and performance. Keeping this in mind can provide tremendous value to operators looking to stay ahead of the competition and ensure customers remain happy. ■

SPONSOR'S COMMENT

With more operators now investing in new fiber and 5G FWA technologies to deliver next-generation services, it's essential to manage these networks effectively to reduce operational costs, monetize services faster, and deliver quality customer experiences.

The 2022 survey results show that operators are under pressure to reduce operational complexity as they move to next-generation networks. While nearly half of survey respondents revealed they're either currently using separate systems to provide network access and manage devices or don't have a solution in place, a large portion say their company's goal is to eventually leverage a centralized OSS to manage their broadband network.

To a large extent, the telecoms industry has plenty of opportunity to innovate its operational processes and leverage centralized automation to address service delivery, QoE, and security. Three out of four respondents stated they are making limited use of automation for their operational and maintenance processes, with most respondents stating they are using manual and reactive methods for network security and making use of various methods to collect and act on network intelligence.

The goal of this year's survey was to investigate how the industry is approaching the challenge of managing the growing demand for broadband services and to identify best practices for managing the transition to next-generation networks successfully. It's clear that operators are turning to network automation and integrated systems to improve customer experience and reduce costs. Yet there are still many challenges standing in their way including legacy systems coupled with technology silos. It will be interesting to see how these trends develop over the next 12 months as operators continue their digital transformations.

VIDEO

KEY TAKEAWAYS:

- Most respondents consider video delivery key for their telecom businesses, including more than a third who consider it a top priority
- The top two drivers for continued video service revenue growth are video as an important source of entertainment and the increase in consumers' video consumption via mobile devices
- More than a third of respondents consider automation important for their video and tv business

▶ Divitel

About Divitel

Subscribers want a smooth-running video service. They expect a high picture quality with all the functionalities like replay tv, catch up TV, NPVR, VOD, etc., all working in the way they are supposed to work.

Giving them that is easier said than done and requires a lot of effort, time and labour resources. We are here to say that it does not have to be that way.

We provide everything needed to ensure that video platforms perform as they should at minimum effort. We offer video platform audits, quality troubleshooting, system integration and day to day management. At all times, we utilize the power of data and automation prevent issues from negatively impacting brand value.

It has long been debated that video, including on-demand video and linear TV, can play an integral role in telecom consumer bundling strategies. Research from Omdia also shows that most converged service providers now offer, or at least enable, access to several third-party streaming applications. Further, telco growth strategies are forecasted to shift away from traditional Pay TV models to focus more on streaming services.

As such, to find out our respondents' views on video as part of the telco business, we investigated its importance in the industry. It is not surprising then that more than four in five industry professionals (85%) agree that video delivery is key for telecom businesses, including more than a third (33%) who consider it a top priority **FIG 6.1**. To succeed in this

increasingly competitive segment, service provider strategies, including their views on key drivers, challenges, methods of delivery and budgets, become crucial.

Investigating the drivers, our survey firstly found that the top driver for continued video service revenue growth is the view that video is an important source of entertainment (50%) whether it be social media or streaming and TV. There is no denying that content consumption has reached new heights in recent years. Many in the industry also point to ways in which 5G will transform video and consumer electronics in the mid-term through innovations and emerging use cases, such as immersive experiences.

Secondly, our respondents believe another key driver for continued video service revenue growth is that consumers are increasingly watching content from their mobile devices (48%). This creates an opportunity for partnering with mobile operators to act as key delivery partners. In turn, for mobile operators, video can act as a

catalyst to justify higher pricing. This is especially true as the hype around the new mobile technology soon begins to dwindle, yet we enter the 5G SA core phase with higher bandwidth and as 5G coverage improves.

Thirdly, the respondents view video as important for working from home and distance learning (41%). This key driver was highly proven during the



Figure 6.1: Importance of Video Delivery for Telecom Business
How important is video delivery for your telecom business?

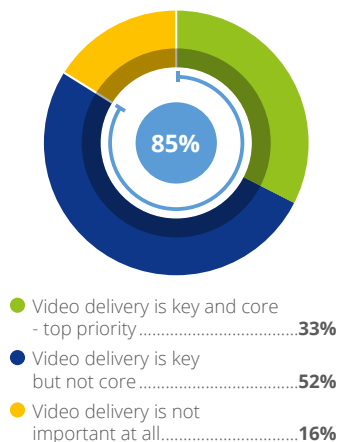
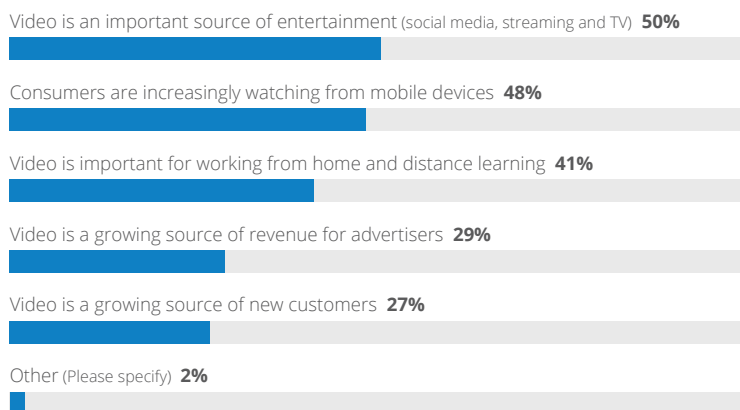


Figure 6.2: Key Drivers for Continued Video Service Revenue Growth
What are the key drivers for continued video service revenue growth? (Select up to three.)



pandemic-induced lockdowns over the past two years which forced millions of households to work and learn from home. Some of those changes have now transformed into more lasting behavioral shifts, such as the more formal introduction of hybrid work at organisations and the growing number of workforces that are now even permanently working from home.

Other drivers include video as a growing source of revenue for advertisers (29%) and a growing source of new customers (27%). **FIG 6.2**

Figure 6.3: Challenges & Obstacles to Operating a Video Platform

What would keep you up at night if you were / are operating a video platform? (Select all that apply.)

Meeting subscribers' expectations with regards to video platform performance and functioning **45%**

Lack of skilled video domain experts or engineers **25%**

Meeting subscribers' content demands **42%**

How to decide what technology fits best to my needs **15%**

Speed and success of deployment of new features/functions/platform components **32%**

How to increase platform performance visibility internally **13%**

Budget restrictions (including video platform total cost of ownership) **29%**

Internal complaints about the effects on brand value **13%**

Subscribers churn very easily **29%**

Other (please specify) **4%**



Further, we asked our survey respondents to evaluate the key challenges they face when operating a video platform. The top two key challenges most likely to keep respondents concerned if they were operating a video platform are meeting subscribers' expectations with regards to video platform performance and functioning (45%) and meeting subscribers' content demands (42%).

Spoilt for choice with over 5600 online video services across 100 global markets (according to Omdia), it is not surprising that consumers' expectations and demands, both in terms of content and service performance, are making the video distribution landscape more complex while also an integral part of service provider delivery strategies.

Speed and success of deployment of new features/functions/platform

components (32%) are also key challenges the industry faces when operating a video platform. With competition flying high, budget restrictions, including video platform total cost of ownership (29%) and subscriber churn (29%) are additional challenges worrying industry professionals. [FIG 6.3](#)

The monetary challenges are understandable considering that video platforms typically follow a low-ARPU subscription model, assuming to sustain large volumes of subscribers. Yet other monetisation models could also take place in parallel, such as a hybrid transactional model.

In terms of considering outsourcing versus delivering video distribution in-house, no single reason stands out dominantly, but business case emerges as the most frequently selected reason (37%).

Other arguments for outsourcing include the desire to reduce and control costs of operation (31%) and to increase efficiency of specific time-consuming functions (31%). Tightly behind are risk mitigation (30%), looking to improve company focus (30%) and freeing up resources (25%). **FIG 6.4**

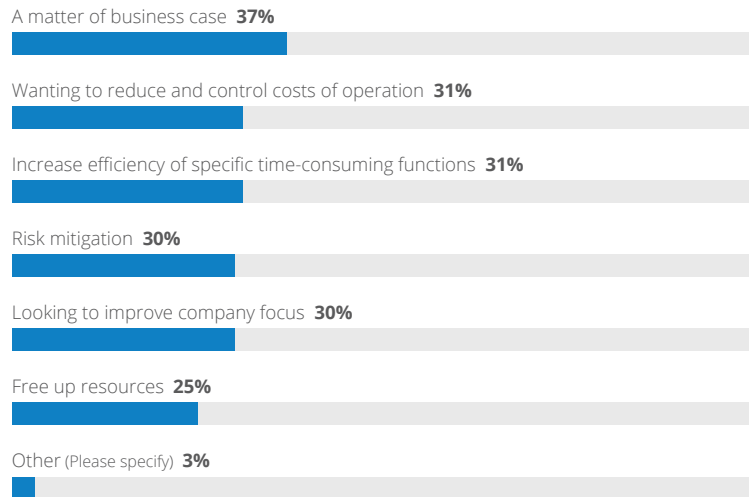
Digging further to better evaluate costs and budget for operations, we asked the respondents about their budget for delivery improvements. There is no clear underlying theme, however, the industry professionals most frequently express other priorities (26%) as the reason for lack of budget for delivery improvements.

When it comes to automating the video and TV business, most respondents (70%) consider automation important, this includes a third of respondents (33%) who find this very important both today and in future, as well as a quarter of respondents (25%) who find automation very important today as they lack sufficient labour resources for their video and TV business.

Externalising some parts of delivery and operations could enable video and TV services to shift focus on the growing consumer demands and expectations as well as to improve and automate their more core types of activities. ■

Figure 6.4: Reasons to Consider Outsourcing Video Distribution

What are the most important reasons for you to consider outsourcing your video distribution? (Select all that apply.)



SPONSOR'S COMMENT

Video is becoming one of the highest commercial priorities for the telecom business as it is used to attract new subscribers who are increasingly watching from their mobile devices. For Telecom brands to be successful, an efficient, high performing video platform is a prerequisite.

Subscribers want a smooth-running video service. They expect a high picture quality with all the functionalities like replay tv, catch up TV, NPVR, VOD, etc., all working in the way they are supposed to work.

Giving them that is easier said than done and can be a real time and resource consuming hassle.

It does not have to be that way.

Divitel makes video distribution effortless. We can help with everything needed to maximize video service performance, quality, operating margin and brand value. From troubleshooting to system integration, to operational support.

INTERNET OF THINGS (IOT)

KEY TAKEAWAYS:

- Healthcare and connected vehicles are the top two most interesting IoT use-cases
- Within automotive IoT, fleet management is considered the most interesting technology
- IoT skills gap and security are the top two challenges delaying or stopping engineers and businesses from adopting and developing IoT applications



About IEEE DiscoveryPoint for Communications

IEEE DiscoveryPoint for Communications is an all-in-one platform built for engineers in industry to design and develop technology solutions. Curated by subject matter experts, this platform brings communications-focused information together from hundreds of vetted sources. Quickly find the technical information you need and extract key insights from your results with machine learning. With IEEE DiscoveryPoint, spend less time searching and more time discovering solutions to optimize, improve, and innovate high-quality products.

<https://discoverypoint.ieee.org/>

The Internet of Things (IoT) and associated services have grown exponentially since the start of the century. Some applications have been accelerated through unprecedented demands in recent years, such as those in the healthcare sector. Others, such as those in the automotive industry, have long been hailed as transformative. These views are also echoed in the results of our survey.

IoT uses and services play an important role in the wider IoT value chain. They create an ecosystem for vertical industries and can direct the telco IoT investment space. As part of our survey, we asked the respondents to pick the most interesting uses of IoT. The top two most interesting areas according to the industry professionals are healthcare (61%) and connected vehicles (60%). **FIG 7.1**

The rise of healthcare applications has been particularly noteworthy in the aftermath of the COVID-19 pandemic outbreak. For instance, applications developed jointly by GE Healthcare and Microsoft enable healthcare professionals to benefit from technology advances such as cloud-based patient monitoring to remotely gather information, while limiting the spread of the infection.

Connectivity has been increasingly gaining traction in the vehicle industry, accelerated by the onset of 4G mobile technology with services such as infotainment or traffic flow information and increasingly moving into ultra-high

reliable services with real-time data access requirements enabled by 5G. Currently the most cited technology supporting connected cars devices is 4G. The Long-Term-Evolution technology is also often cited to remain the dominant technology in the long term, despite the highly anticipated acceleration in 5G connections in the near term.

Digging further into the automotive industry, we asked the survey respondents to rate technologies within automotive IoT that their companies are most interested in. Nearly half of the votes view fleet management (45%) as the most interesting technology. This technology automates cumbersome logistics by connecting fleets so they can be more easily monitored and controlled, both for tracking of their whereabouts and also tracking of health and performance. **FIG 7.1** For instance, fleet analytics can improve precision management, while remote diagnostics can avoid downtime. These tools help enterprises increase savings while enhance decision-making processes and manageability.

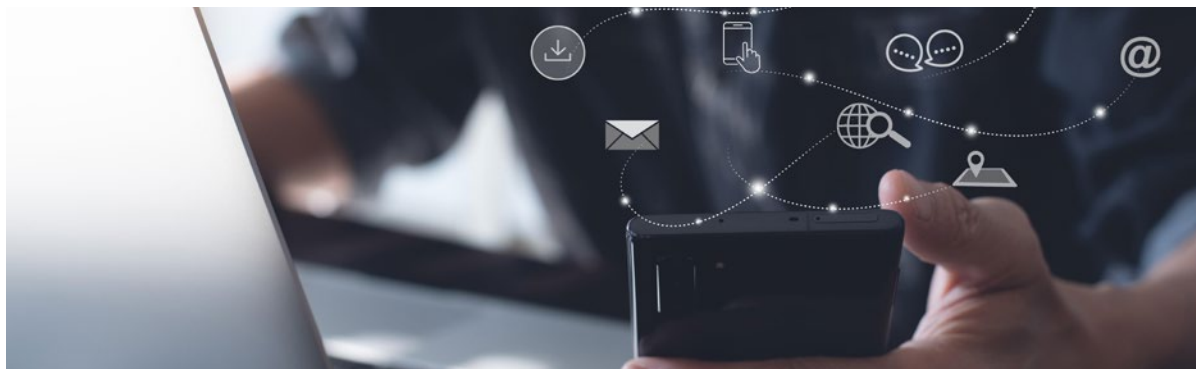
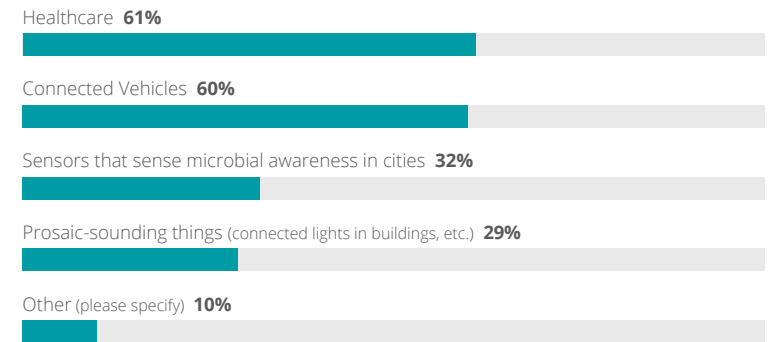
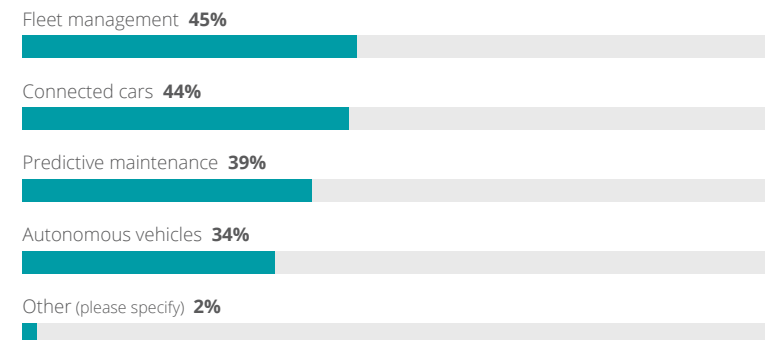


Figure 7.1: Most Interesting Uses of IoT
What do you regard as the most interesting use of IoT (internet of Things)? (Select all that apply.)



“CHOOSING TRUSTED PARTNERS TO SECURE NETWORKS AND ADDRESS ANY PRIVACY OR COMPLIANCE GAPS, ALONGSIDE ADDRESSING SKILLS GAPS AND LACK OF RESOURCES ARE THE TOP TWO FOCUS AREAS THAT CAN BE TRULY TRANSFORMATIVE TO THE IOT MARKET.”

Figure 7.2: Automotive IoT Technologies of Most Interest
Which technologies in automotive IoT is your company most interested in? (Select all that apply.)





The second most interesting automotive IoT technology selected by our respondents is connected cars (44%). Equipped with internet access, connected cars have the ability to optimise their operations and manufacturers continue to build functionalities such as Vehicle-to-Vehicle communications or Vehicle-to-Infrastructure systems. This market is expected to undergo an increase in demand and growth in the long term.

Further, among the top three votes from our respondents is also predictive maintenance (39%), a technology that is thought to gain relevance as more cars and other vehicle types become more reliant on electricity.

Finally, autonomous vehicle earned 34% of the respondents' votes as another interesting technology in automotive IoT. New legislations recently passed for autonomous driving both in the UK and the EU certainly could underpin some of the growth in this sector. These legislations aim to boost road safety, improve community connectivity, and create more jobs.

Figure 7.3: Challenges Interfering with IoT Adoption and Development
What are the biggest challenges delaying or stopping engineers, and businesses from adopting and/or developing IoT applications, particularly in the Telecom or Automotive Space? (Select all that apply.)

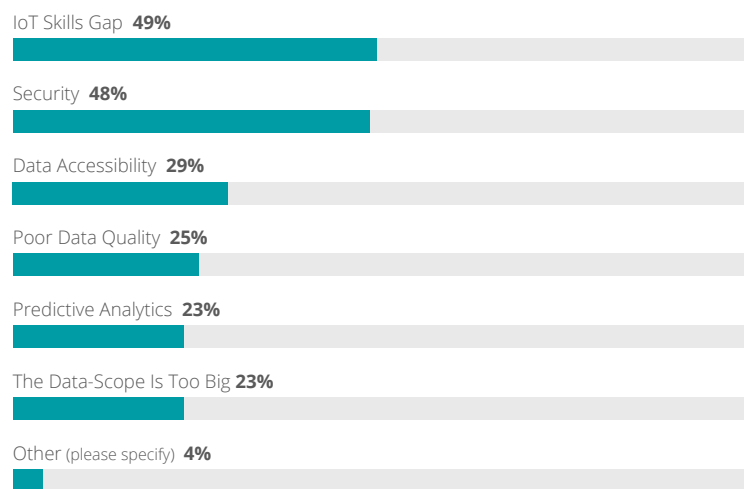
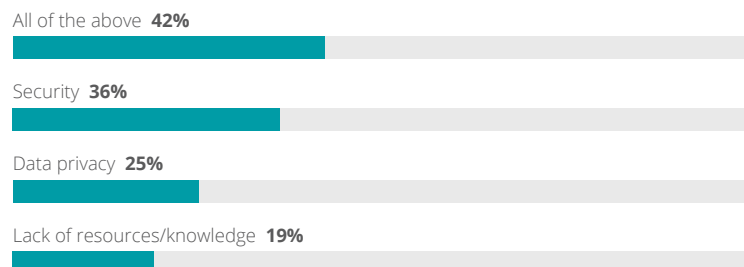


Figure 7.4: Biggest Risks Associated with IoT
What's the biggest risk associated with the Internet of Things? (Select all that apply.)



Yet, anticipated future growth does not come without its difficulties. As such, we aimed to dig deeper and uncover the biggest challenges the industry sees either delaying or stopping engineers and businesses from adopting or developing IoT applications, particularly in the telecoms or automotive space.

IoT skills gap comes as the top challenge for organisations (49%), tightly followed by security (48). Other challenges include data accessibility (29%), poor data quality (25%), data scope too large (23%), predictive analytics (23%). The respondents further commented on the availability (or the lack of) of affordable and simple NB-IoT and LTE-M devices, lack of attractive solutions and uncertain revenues. [FIG 7.3](#)

Looking at IoT adoptions within the respondents' organisations and what the associated barriers are, respondents consider return on investment (ROI) as the most challenging aspect (50%). It is also worth noting here that IoT has traditionally seen operators engage in the connectivity layer of the value chain, with few dipping their toes into the devices or platform and application layers. The latter layer is considered by many as the part with the highest revenue share in the IoT market, meanwhile connectivity makes up the smallest share.

Closely behind ROI is cybersecurity (48%) as the second most challenging aspect to IoT adoption and

development. This is followed by lack of resources (32%) as the third biggest challenge for our industry respondents.

Some of this sentiment is also on display when we further asked the respondents about the associated risks that they see with IoT more widely. Most industry professionals believe that on the whole security, data privacy, and lack of resources or knowledge are all top threats in IoT, with security as the most frequently selected single risk (36%). [FIG 7.4](#)

These results are no surprise. The exponential increase in connected devices in recent years naturally exposes networks and systems to more security threats. With more data collected than ever before data compliance as well as privacy of IoT devices' users and applications are also under greater threat. Additionally, IoT devices today are significantly more powerful and can handle more tasks, making them more vulnerable to opportunistic cybercriminals.

Acting with agility to secure end-user devices becomes key in minimising cyberthreats while also supporting the growth of the market. Both vendors and operators should place greater emphasis and prioritise IoT security.

Looking at ways to nurture the growth of the IoT market, there is a consensus among our survey respondents that more information and resources are needed.

Lack of resources or information reappeared as a recurring challenge at several stages of the survey, including as the top reason for hampering progress and deployment of IoT applications. As such, we further investigated what types of information solutions deployment teams might need to conduct their jobs and tasks more effectively and efficiently.

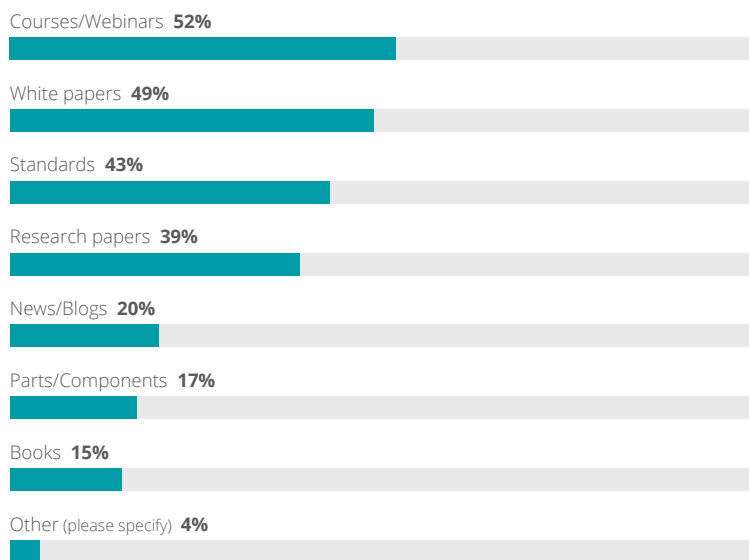
Structured types of information such as webinars and courses are the most frequently selected resource among our industry professionals with 52% of the time. This is then closely followed by self-study types of resources, such

as whitepapers (49%), standards (43%), research papers (39%), and news and blogs (20%), making up the top five most frequently selected resources. [FIG 7.5](#)

With 5G massive Machine Type Communication on the horizon, a rise in applications and devices for many industries, including those discussed here, is expected. Choosing trusted partners to secure networks and address any privacy or compliance gaps, alongside addressing skills gaps and lack of resources are the top two focus areas that can be truly transformative to the IoT market. ■

Figure 7.5: Types of Information Solutions Needed Improved Effectiveness and Efficiency

What types of information solutions does your team need to more effectively/efficiently do your job? (Select all that apply.)



SPONSOR'S COMMENT

With the rapid adoption and expansion of IoT and related technologies, it is more important than ever for engineers and researchers to have access to cutting-edge and reliable information that is applicable to their workflows. As noted in this report, there has been an accelerated need for IoT in the healthcare and automotive industries and organizations need to keep up with this demand. The best way for technical professionals to stay up to date with these demands and the evolving technology landscape is to have access to tools and resources that provide research and content in those industries. In addition, with technologies often overlapping and expanding, technical professionals may also have a need to learn more about a topic that may be outside their expertise.

With robust tools such as IEEE DiscoveryPoint for Communications, engineers and researchers can quickly and easily get the information they need to bridge any gaps in their knowledge and drive these IoT-related technologies forward. With access to courses, whitepapers, vital prior research, and industry standards, IEEE DiscoveryPoint for Communications provides a trusted source that engineers across industries can leverage to develop and confirm the skills they need to do their jobs.

OPEN RAN

KEY TAKEAWAYS:

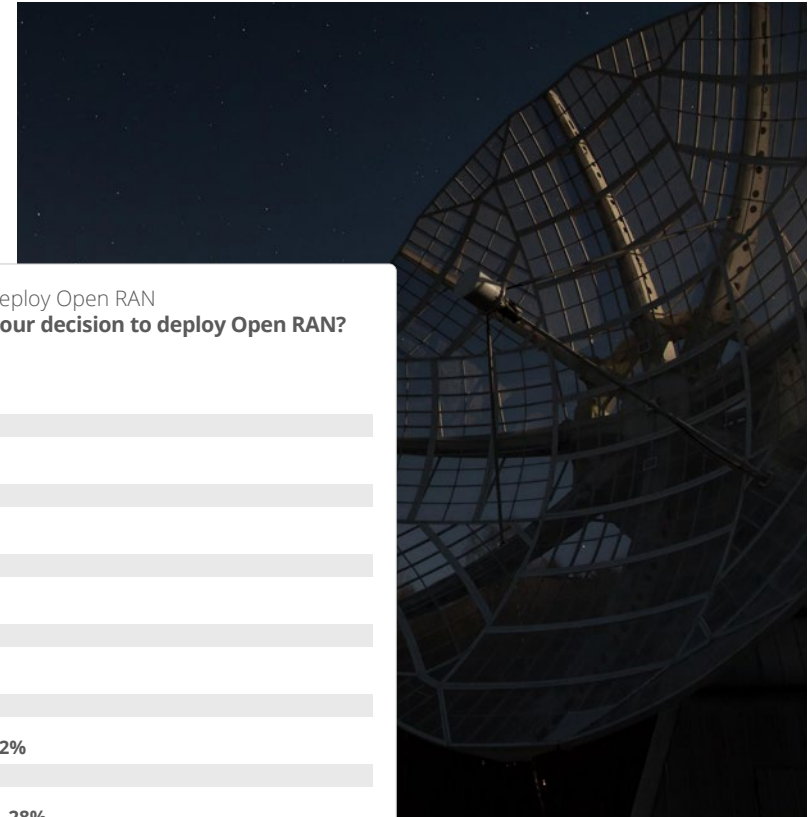
- Nearly two thirds of respondents either plan to or have already deployed Open RAN commercially
- Reflecting on Open RAN security, the industry professionals predominantly agree that incorporating well-defined, telecom-driven security standards from '3GPP and ORAN' will be most critical
- An immature ecosystem is viewed as the biggest inhibitor to the Open RAN market success

Rakuten Symphony

About Rakuten Symphony

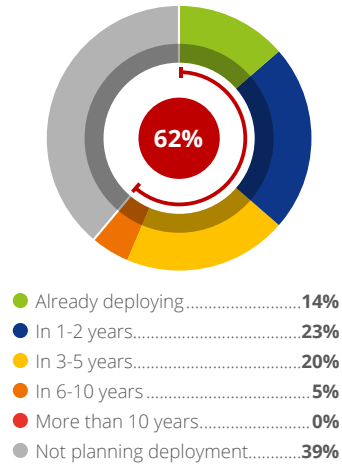
Rakuten Symphony is reimagining telecom, changing supply chain norms and disrupting outmoded thinking that threatens the industry's pursuit of rapid innovation and growth. Based on proven modern infrastructure practices, its open interface platforms make it possible to launch and operate advanced mobile services in a fraction of the time and cost of conventional approaches, with no compromise to network quality or security. Rakuten Symphony has headquarters in Japan and local presence in the United States, Singapore, India, Europe and the Middle East Africa region. For more information, visit: <https://symphony.rakuten.com/>

Inspired by the IT sector’s evolution, new and exciting developments in the open-source networking community are now also driving forward many architectures in telecoms. One such area includes the opening and disaggregation of a telecoms operator’s Radio Access Network (RAN), allowing individual interfaces to interoperate within all parts of the RAN.



Open RAN was originally deemed to introduce a more cost-effective way to provide network coverage in remote areas which were often regarded as commercially unviable. Another attractive aspect included the diversification of suppliers for different sub-components in the RAN. As such, it gained the support of the operator community, driving some of the Open RAN standards to help service providers unlock the vendor lock-in. Since then, the key drivers to adopt Open RAN have further evolved, a host of lab and field trials have followed, and a small number of greenfield and brownfield deployments have rolled out.

Figure 8.1: Plans to Deploy Open RAN Commercially
When do you plan to start deploying Open RAN commercially?

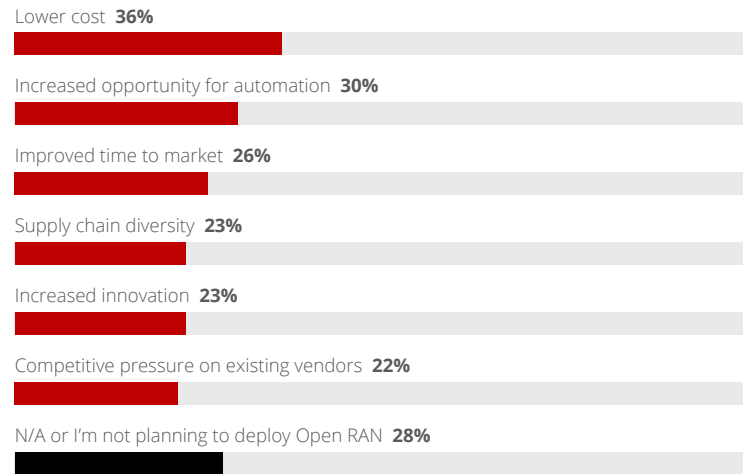


Despite the fact deployments to-date remain in the early stages, the majority of industry professionals believe there is a place for Open RAN in commercial deployments. Nearly two thirds (62%) of respondents have or plan to deploy Open RAN commercially in the coming years, including a small yet not insignificant 14% who have already done so. Meanwhile, another quarter of

respondents (23%) plan to follow suit in the next one to two years. **FIG 8.1**

To understand the driving factors behind these results, we asked our survey respondents to reflect on their decisions to deploy Open RAN. While no single response dominantly stands out, the most frequently selected answer is lower cost (36%). This is followed by an increased opportunity for automation

Figure 8.2: Key Drivers in Decision to Deploy Open RAN
What are the top driving factors in your decision to deploy Open RAN? (Select all that apply.)



(30%), and an improved time to market (26%). Other reasons include supply chain diversity (23%), increased innovation (23%), and competitive pressure on existing vendors (22%). **FIG 8.2**

Meanwhile, investigating the barriers to deployment, we asked our respondents to rate what best describes their reasons for not having deployed Open RAN yet. Once more, no single

significant determinant revealed itself but instead we can see a mixed bag of causes, potentially indicating the need for further business model clarity and technical maturity.

While ‘lower cost’ is a driving factor for deployment (as seen in Figure 2), uncertainty over the total cost of ownership (TCO) is the most frequently selected reason (25%) not to have

deployed Open RAN yet. This could indicate that the industry still has some weighing out to do in terms of long-term cost benefits versus initial costs to convert.

Closely following TCO is readiness to meet the respondents’ requirements (23%). Meanwhile, other concerns include those over system integration (20%) and security (18%).

Though the introduction of open networks brings about many benefits, disaggregating the RAN can also lead to more open interfaces which in turn can expose networks to more cyber-attacks. In fact, our 2022 Telecoms.com 5G survey found that most industry professionals considered Open RAN as more concerning in terms of security when compared to traditional RAN.

Therefore, we further investigated what the industry views as the most critical way forward to secure Open RAN. The respondents predominantly agree (51%) that incorporating well-defined, telecom-driven security standards from 3GPP and the ORAN, referring to the ORAN Alliance, is the most critical pathway to network security. Many respondents also consider leveraging

proven IT security best practices from other industries (32%) and leveraging solutions from third-party security vendors (31%) as critical. **FIG 8.3**

Artificial Intelligence (AI) and Machine Learning (ML) technologies have been the driving force behind automation of networks. The functionalities driven by AI and ML can support a number of cumbersome and costly tasks as well as introduce benefits from optimisation to monetisation of networks.

For instance, zero-touch provisioning for cell sites contribute towards cost

efficiency, whether it be on the TCO or long-term operational costs, while also removing the need for human intervention and thus, aiming to eliminate human errors. The RAN Intelligent Controller (RIC) enables interoperability across different hardware and software, supports intelligent decision-making, can act as a software hosting platform while enabling operators to monetise the RAN. Meanwhile, traffic steering capabilities help improve network agility calling up real-time data to minimise outages and optimise end-user experiences.

When asked to choose an AI/ML-driven next-gen network benefit that is most appealing as part of an Open RAN deployment, the industry professionals predominantly see most of these benefits as appealing to similar extents. **FIG 8.4**

Rounding up our analysis on the current state of Open RAN and looking to its future progress, we aimed to understand what it will take for the Open RAN market to succeed. As such, we asked our respondents to evaluate what they view as the biggest barriers.

Immature ecosystem is viewed as the biggest inhibitor (48%) to the Open RAN market success. However, the good news is that there are pockets of concerted efforts emerging and partner ecosystems are being created. For instance, in October of this year Dell Technologies announced it has partnered with Fujitsu in an effort to accelerate the adoption of Open RAN. Their collaboration will see solutions developed that enable operators to design their open networks more efficiently.

Another key barrier that goes hand-in-hand with an immature ecosystem includes the lack of needed skillsets (33%). **FIG 8.5** As such, there is certainly an argument for skilling up engineers more rapidly now to ensure that, as demands grow in the near-term, the right skills and resources will be readily available.

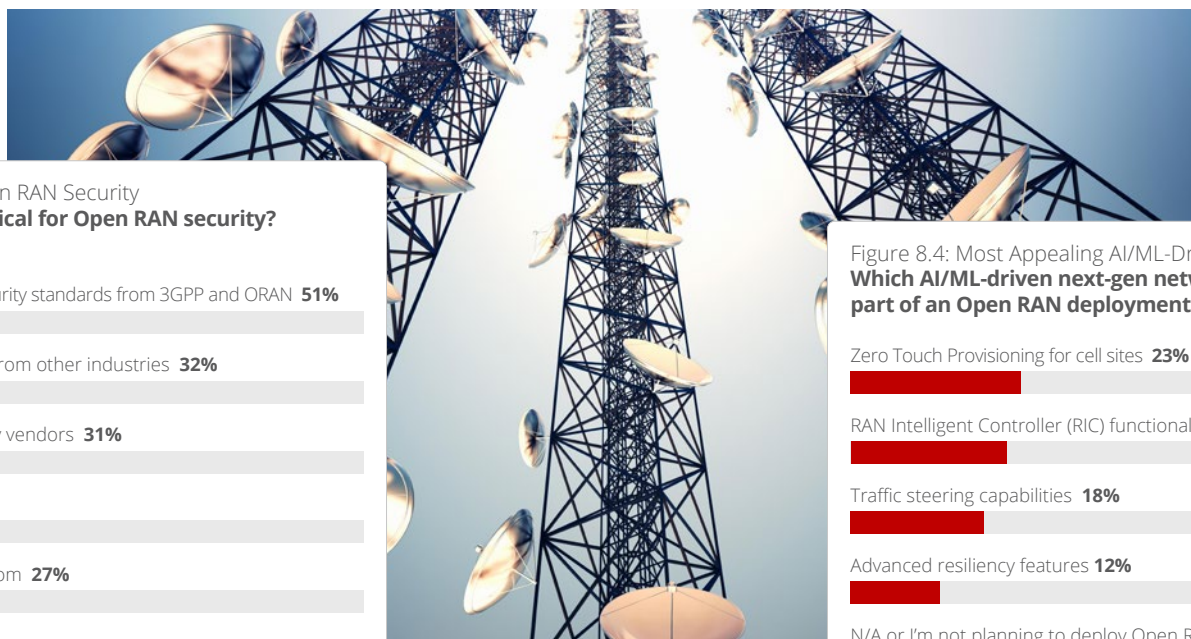


Figure 8.3: Most Critical Factors for Open RAN Security
What do you believe will be most critical for Open RAN security?
(Select all that apply.)

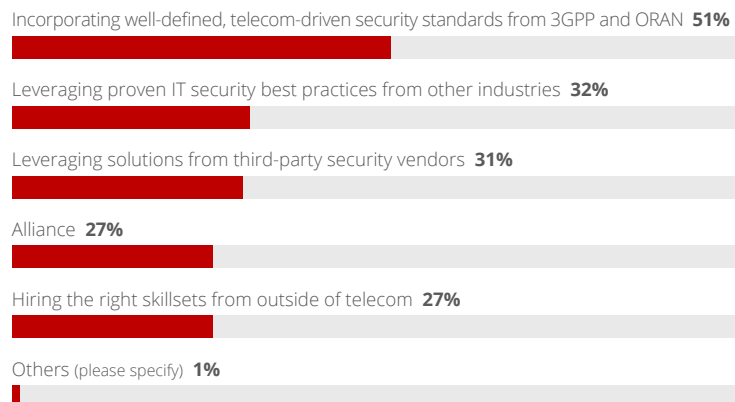


Figure 8.4: Most Appealing AI/ML-Driven Next-Gen Network Benefit
Which AI/ML-driven next-gen network benefits most appeals to you as part of an Open RAN deployment

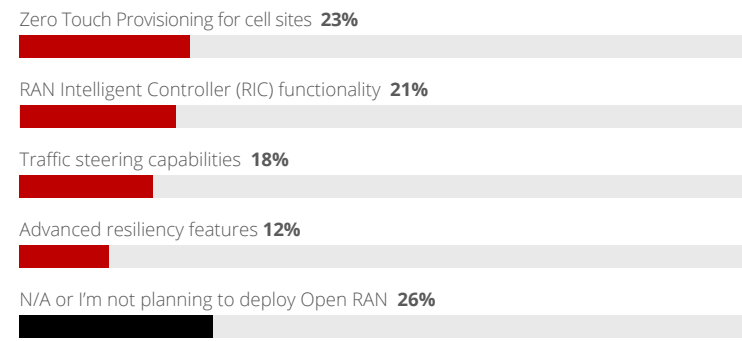
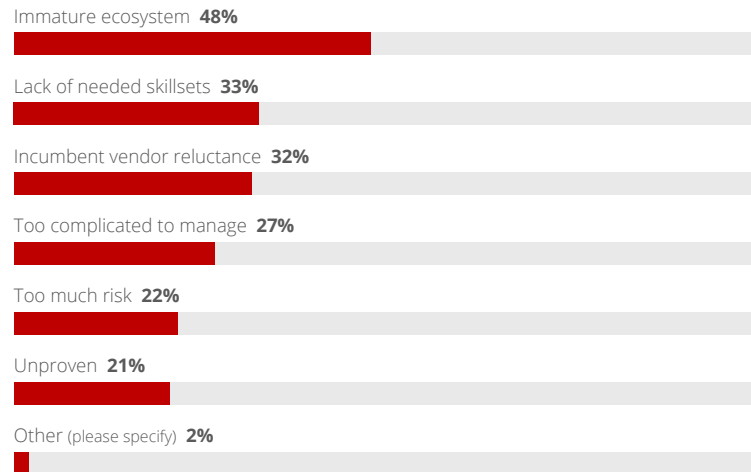


Figure 8.5: Biggest Inhibitor to Open RAN Market Success

What are the biggest inhibitors to Open RAN market success?

(Select all that apply.)



This sentiment is also shared with one of the key driving forces behind the open-source networking movement in the telecom industry, Telecom Infra Project (TIP). The organisation aims to address the global skills and resource needs through collaboration. In partnership with Accenture, they have created the TIP Academy which plans to skill up a workforce ready to lead on many aspects of open-source networking including solution design, development, testing, and deployment of open and disaggregated network solutions.

Finally, the industry agrees that the incumbent vendors' stance or reluctance (32%) on Open RAN can

also be another key contributing factor in the progress and success of this market. While there is no negating these challenges and barriers are real, they are also surmountable with more concerted efforts from the wider telecoms industry. ■

“DESPITE THE FACT DEPLOYMENTS TO-DATE REMAIN IN THE EARLY STAGES, THE MAJORITY OF INDUSTRY PROFESSIONALS BELIEVE THERE IS A PLACE FOR OPEN RAN IN COMMERCIAL DEPLOYMENTS.”

SPONSOR'S COMMENT

This survey shows a clear commitment to Open RAN, with over 60% of respondents either having deployed or planning to deploy Open RAN commercially. The remaining third we believe, will plan to adopt when appropriate.

The telecom market has progressed from a promised vision into a reality. Still, concerns remain about adopting new approaches, architectures, and operations. Similar notions apply to any industry experiencing a shift from a well-understood architecture and supply chain to one that challenges the status quo.

In this survey, an immature ecosystem is noted as the biggest inhibitor to the success of the Open RAN market. However, this is standard with any new technology, and we see a need for mutual learning and education for both sides of any Open RAN deployment project.

Rakuten Mobile and Rakuten Symphony successfully deployed the world's first end-to-end fully virtualized, cloud-native Open RAN mobile network with one unified management and automation system. As the survey correctly notes, cost reduction and high automation are the leading motivators in Open RAN adoptions. They were the primary motivators for Rakuten, and we have proven both are achievable.

The survey highlights the challenge of change, and the decision is whether to lead or to follow. Based on our experience in Japan and globally, we have the expertise to build successful Open RAN networks and are willing to answer any questions from those interested.

ANNUAL INDUSTRY SURVEY 2022 REPORT

APPENDIX - SURVEY RESULTS

BACKGROUND AND INDUSTRY LANDSCAPE

Q1. Please select the type of company you work for:

Mobile / Fixed / Virtual Operators	34%
Hardware or Software Vendor	22%
System Integrator / Consultancy	20%
Education Institute / Research or Consulting Firm	7%
Cloud/Web Services / OTT	4%
Government / Regulator / Authority	2%
Media / Entertainment	2%
Value-Added Reseller (VAR)	1%
Enterprise User	1%
Other (please specify)	7%

Q2 - Please choose your Job Function from the list below:

Corporate Management (CEO, COO, CFO, CTO, VPs)	25%
Mid-Level Management	20%
Sales / Marketing	18%
Engineering / Developer	14%
IT Management (CIO, VPs, Director of IT)	4%
Analyst / Research	8%
Network Operations	3%
IT Operations	2%
Administrative / Finance	1%
Other (please specify)	4%

Q3 - In which region is your company located?

Europe	41%
North America	21%
Asia / Asia Pacific	18%
Africa	8%
Middle East	8%
South America	5%

Q4 - How long have you worked in the telecommunications industry?

Less than 5 years	7%
5 to 9 years	11%
10 to 14 years	14%
15 to 19 years	16%
20 to 24 years	13%
25 years or more	39%

Q5 - How would you describe the telecoms industry's overall business performance so far in 2022?

Excellent	19%
Good	44%
Average	26%
Below average	9%
Poor	2%

Q6 - How do you feel about the telecoms industry's business outlook for 2023?

Very positive	31%
Somewhat positive	38%
Neutral	19%
Somewhat negative	11%
Very negative	2%

Q7 - Which of the following best matches your views of the post-Covid-19 telecoms industry?

We are already in the post-pandemic era and there is an ongoing supply chain crisis impacting the telecoms industry heavily	30%
The telecoms industry deftly adapted to the changing demand during Covid-19, so the post-pandemic view will be mostly business as usual	29%
Pent-up demand will drive the telecoms industry to bounce back stronger than pre-Covid-19 years	19%
The world will not fully come back to pre-Covid-19 "normal" in the next two years, neither will the telecoms industry	16%
None of the above	6%

Q8 - Which of the following are likely to be priority investment areas for your company in 2023? (Select all that apply)

Security	41%
Digital transformation	40%
IoT (incl. industrial IoT)	33%
Broadband (incl. full Fibre deployments and Passive Optical Networking)	30%
BSS/OSS modernisation	28%
5G initial deployment	27%
Artificial Intelligence (incl. Machine Learning)	26%
Edge computing	25%
Open RAN deployment	24%
5G densification	24%
Private networks	22%
Virtualization	22%
5G Standalone (SA) mode deployment	22%
Migration to public cloud	17%
Service diversification and value-added services	16%
Next generation access technologies	16%
None of the above	9%
Content (e.g., content rights, original content production)	7%

ANNUAL INDUSTRY SURVEY 2022 REPORT

APPENDIX - SURVEY RESULTS

BACKGROUND AND INDUSTRY LANDSCAPE

Q9 - What are the most overhyped emerging services or technologies today? (Select all that apply)

Metaverse	66%
Artificial Intelligence (incl. Machine Learning)	38%
Open RAN deployment	27%
Edge computing	23%
IoT (incl. industrial IoT)	19%
5G initial deployment	17%
Digital transformation	16%
5G densification	15%
5G Standalone (SA) mode deployment	15%
Next generation access technologies	15%
Private networks	14%
Migration to public cloud	12%
Security	11%
Virtualization	10%
Service diversification and value-added services	7%
BSS/OSS modernisation	6%
Content (e.g., content rights, original content production)	5%
None of the above	3%

Q10 - Which of the following are the greatest potential threats to your company's long-term business success? (Select all that apply.)

Increased pressure to lower prices and profit margins	48%
Inability to lower operating expenses	34%
Failure to roll out new technologies fast enough	31%
Competition from hyperscalers (e.g., Google, Amazon, Microsoft)	29%
Regulatory restraints	26%
Inability to adopt agile service model	22%
Failure to address network complexity issues	21%
Lack of demand from business customers	20%
Lack of contingency plans for disruptions (e.g., a pandemic or climate change)	18%
Lack of demand from consumers	16%
Other (please specify)	7%

Q11 - Which of the following statements match well with your current view on embracing public cloud and on running telco applications on the public/private cloud? (Select all that apply)

Our biggest concern with moving to the public cloud is security	44%
It's hard to make the business case to move to the public cloud because private cloud is required to address security issue, meaning the efficiency savings are not as achievable when IT and network run over the two cloud types	37%
It's very important that applications can run on all versions of public clouds and are portable among cloud vendors to avoid vendor lock-in	32%
The operational efficiencies derived from the scalability and flexibility of running IT systems on the public cloud are a key driver	27%
Embracing public cloud providers will push operators aside and into a utility role, as they lead on edge platforms, automation, the rollout of AI and other key strategic technologies	23%
The public cloud providers are best placed to support edge computing requirement needed for low latency use cases	19%
Moving BSS and OSS to the public cloud provides the scalability and on-demand applications necessary for 5G monetisation	18%
Other (please specify)	6%

ANNUAL INDUSTRY SURVEY 2022 REPORT

APPENDIX - SURVEY RESULTS

5G

Q12 - How important is 5G SA Core in the adoption of 5G?

It'll help for sure, but it's just another step in the evolution journey	42%
Critical to satisfy customer 5G expectations	25%
Important for our B2B customer strategies but not so much for the consumer segment	23%
It will make no difference at all	9%

Q16 - What are the key challenges in deploying 5G SA Core? (Pick the most significant two)

High cost (network equipment and deployment)	45%
Deployment complexities	35%
Insufficient business case	34%
Lack of internal 5G SA Core expertise	22%
CaaS/PaaS platform maturity	14%
Other (please specify)	4%

Q13 - What is the most promising way to recoup the investment on deploying 5G network infrastructure? (Pick up to 3)

Generate new revenue streams from new 5G use cases	61%
Adopting cloud-native, end-to-end software	34%
Moving to open and multi-vendor architectures in the Core	29%
Implement CI/CD and other automation best-practices to reduce overall OpEx	28%
Shifting telco workloads to the public cloud to benefit from its scale and efficiencies	26%
Leveraging prior infrastructure choices made for 4G	26%
Other (please specify)	0%

Q14 - What are the main use cases you offer/plan to offer in your 5G SA Core network? (Rank in order of importance.)

	1st	2nd	3rd	4th	5th
Migrate/Upgrade existing consumer customers to 5G	22%	15%	15%	23%	25%
Introduce/Expand Fixed Wireless Access (FWA) offerings	19%	22%	16%	20%	23%
Provide 5G Enterprise and Private Network offerings	27%	25%	20%	18%	11%
Support massive IoT connectivity	12%	16%	28%	21%	24%
Support Network Slicing to provide dedicated network slices for different use cases	21%	22%	22%	18%	17%

Q15 - Considering the 5G use cases you chose in the previous question, what is the most important reason to implement 5G SA cloud-native architecture? (Rank in order of importance.)

	1st	2nd	3rd	4th	5th	6th
It provides more flexibility and scalability to meet rigorous application requirements in different verticals	38%	18%	19%	15%	7%	3%
It provides more infrastructure options to deploy on-prem, public cloud, or hybrid cloud	13%	24%	18%	26%	16%	3%
It reduces overall TCO	24%	14%	19%	20%	14%	8%
It speeds Time-to-Revenue for new services	16%	23%	19%	18%	18%	7%
It solves the vendor lock-in problem	3%	14%	4%	8%	28%	43%
It encourages innovation from new, best-of-breed vendors	6%	8%	20%	13%	17%	36%

Q16 - If you could save 36% TCO over 5 years, how quickly would you like to move to 5G SA deployments?

Immediately	7%
Within the next 6-12 months	32%
Withing the next 1-2 years	35%
Not before 2025	14%
Not likely in our plans	12%

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DIGITAL TRANSFORMATION

Q17 - Is your digital transformation strategy mostly focused on improving internal efficiencies or launching new digital services?

We are mostly looking to digitise our operations to save on costs	45%
We are primarily focused on transforming internal processes	39%
We are not focused on digital transforming any more	12%

Q18 - Is your business looking at ways to utilise the metaverse in its digital transformation journey?

No, the metaverse is not commercially interesting to us	56%
Yes, we are assessing metaverse type offers for consumers	23%
Yes, we are looking to reduce dependency on physical stores	21%

Q19 - Overall, would you rate the digital transformation efforts undertaken by your business as a success?

Yes, we are more competitive now that we are seen as a digital brand	35%
Yes, it has made a huge difference to internal operations	31%
No change	25%
The term "digital transformation" is no longer relevant	6%
Our digital transformation projects failed in their objective	3%

Q20 - On the journey to Cloud, how would you rate the transformation of your business?

We are moving steadily in the direction of in-house/private cloud	28%
We've just started on a virtualization journey	25%
We are moving steadily to hybrid or public cloud	24%
We haven't really started and rely mainly on bare metal	13%
We are significantly progressing to public cloud and have preferred single vendor/s	10%

Q21 - What is the main barrier to your progression with Cloud?

Wider organisational capabilities are sub-optimal	30%
Cost of change is too high (transition costs)	27%
Senior management reluctance or lack of buy-in	23%
Uncertainties related to vendor support	20%

Q22 In terms of monetization of evolving capabilities...

We have lots of service concepts but configuration and testing of services are challenging	36%
Configuration and testing of services are working well but we cannot configure our monetization platform/s	26%
We are ready to monetize a wide range of upcoming services, whatever they might be	26%
Our monetization tools are handling whatever upcoming services we provide right now – but we are constrained when it comes to future services	12%

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BSS MONETISATION

Q23 - What are your plans and priority to enable each of the following new revenue streams?

	No plans	Already launched	In the next 0-24 months	In the next 25-48 months	Beyond 48 months
Push for digital lifestyle with existing 3G & 4G	31%	43%	18%	5%	3%
Launch a digital brand	31%	32%	24%	9%	3%
Launch specific IoT solutions	18%	30%	36%	12%	4%
5G enhanced mobile broadband and/or FWA	26%	27%	32%	11%	4%
5G B2B and/or B2B2X partner ecosystem	24%	19%	35%	12%	10%
Launch MVNE or wholesale services	41%	18%	26%	9%	5%

Q24 - What is your strategy for BSS modernization and harnessing new monetization opportunities (e.g., support for 5G use cases)?

Will upgrade existing BSS and charging stack to support new use cases for enterprise and B2B2x	24%
Will upgrade existing BSS and charging stack to support new use cases for B2C	12%
Will create a parallel BSS and charging stack for new monetization opportunities	10%
Maintain existing stack with a gateway module to support 5G SA	9%
Already upgraded existing stack to be 5G ready	7%
Already created a parallel stack for 5G	6%
Evaluating to outsource my BSS for new monetization opportunities	5%
Undecided	28%

Q25 - How important are the following monetization software features in helping you win the 5G market?

	Not at all important	Not very important	Somewhat important	Very important	Critical
Ability to deliver a digital experience for the end customer	10%	5%	26%	35%	23%
Create a new partner ecosystem offering (beyond connectivity)	10%	9%	24%	37%	21%
Ability to push new products and upgrades at a fast speed	9%	10%	22%	38%	21%
Ability to support new innovative 5G use cases for consumers	13%	10%	20%	41%	17%
New commercial models for B2B, B2B2X, etc.	10%	9%	30%	38%	14%
Cloud-native and scalable to handle 5G traffic	9%	9%	28%	39%	14%
Converged to cater to multiple lines of businesses	9%	10%	38%	34%	10%

Q26 - Does your current BSS stack support multiple lines of businesses (fixed, mobile, broadband, etc.) in one stack?

Yes, our current BSS supports multiple lines of businesses, and we have the same BSS stack for all of them.	44%
No, our current BSS does not support multiple lines of businesses, but we do have plans to upgrade BSS to support multiple line of businesses.	21%
No, our current BSS does not support multiple lines of businesses, and we have no plans to expand to other lines of businesses.	19%
Yes, our current BSS can support multiple line of businesses, but we have one BSS stack for each line of our businesses.	9%
No, we have a digital experience layer on top of our multiple BSS stacks that enables a converged experience although in the backend it is separate	7%

Q27 - What is your BSS monetization strategy to enable B2B2x and partner ecosystem offerings?

We are planning to introduce marketplace solutions and partner management capabilities to provide advanced services to enterprises.	33%
We have no plans to enable B2B2x and partner ecosystem in the next 24-36 months.	29%
We are planning to partner with hyperscalers and provide connectivity services in their marketplaces.	16%
We are planning to partner with our BSS vendors to have them aggregate services, manage an ecosystem of partners and provide marketplace technology while we front-end the selling of services to our customers.	14%
We have already launched marketplace(s) for enterprises.	8%

Q28 - In your plans to modernize your BSS, which functions are you prioritizing? (Select all that apply.)

We are prioritizing the digital layer with functions such as product catalog and order management across BSS systems.	27%
We are prioritizing the development of marketplace and partner management capabilities for our B2B business.	24%
We are prioritizing the convergence of all BSS stacks.	20%
We are prioritizing new converged charging systems.	18%
We are not investing in any BSS modernization.	18%
We are just focusing on building a new stack for revenue opportunities such as 5G-enabled services, IoT, digital brands, MVNE, wholesale, private 5G networks, etc.	16%
We are rebuilding a full stack from scratch on traditional businesses such as B2C.	11%
We are prioritizing the sales enablement layer for B2B, e.g., CPQ.	6%

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BROADBAND SERVICE MANAGEMENT

Q29 - What are the biggest challenges your company faces in achieving zero-touch broadband network resource and service management? (Select all that apply.)

Legacy infrastructure	50%
Siloed operations across technologies	40%
Growing multi-vendor network environments	33%
Lacking proper analytics/insights	31%
Manual incident processes/workflows	28%
Other (please specify)	4%

Q30 - How is your company delivering and managing fixed broadband services such as FTTx or FWA today?

Separate systems to provision access and manage devices at the premise	26%
Using one system to manage access, while devices at the premise remain unmanaged	22%
Using a single system to provision access and manage devices	17%
We don't offer these types of broadband services today	35%

Q31 - What is your company's OSS strategy for managing your broadband network, which may include multiple services, virtualized technologies, and access technologies?

Use a centralized OSS across multiple access networks	43%
Keep operations separated	19%
Use multiple OSS systems, with some spanning multiple access networks	18%
Maintain separate systems across different access networks	14%
Other (please specify)	6%

Q32 - How do you gain subscriber insights, while also managing and assuring fixed broadband service quality today? (Select all that apply)

Data collection and/or traps from vendor EMS/NMS	25%
Data collection and/or traps using SNMP	24%
Deep Packet Inspection (DPI)	24%
In-house tools using NetFlow/IPFIX or IPDR data	21%
Hardware probes	20%
Third-party software using NetFlow/IPFIX or IPDR data	17%
My current OSS performs this capability	11%
N/A; We don't do this	28%

Q33 - How is your company currently operationally addressing fraud and/or network security in your broadband access network for customer devices like cable modems, residential gateways, or CPEs?

IT tools in network security	34%
We don't have these functions deployed today and are not planning to do so in the near term (12-18 months)	16%
Automated firmware updates to devices to minimize risk of breach	15%
In-house built tool for scripts and/or queries from provisioning system	13%
Manual and reactive firmware updates to devices if we encounter a threat	9%
In-house built tool for scripts and/or queries IPv4 or IPv6 address lease information	8%
We don't have these functions deployed today but are planning/considering doing so in the near term (12-18 months)	5%

Q34 - How much of your company's operational processes are currently automated for your broadband services?

Our operational and maintenance processes are partially automated with our systems executing specific, repetitive tasks	56%
All of our operational and maintenance processes are executed manually, with little monitoring assistance from our systems	18%
We utilize closed-loop automation where our system senses environmental changes in real-time and optimizes and adjusts itself to the circumstances	17%
We have a fully autonomous network where our system has closed-loop automation capabilities across multiple services and domains	10%

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VIDEO

Q35 - How important is video delivery for your telecom business?

Video delivery is key but not core	52%
Video delivery is key and core - top priority	33%
Video delivery is not important at all	16%

Q36 - What are the key drivers for continued video service revenue growth? (Select up to three.)

Video is an important source of entertainment (social media, streaming and TV)	50%
Consumers are increasingly watching from mobile devices	48%
Video is important for working from home and distance learning	41%
Video is a growing source of revenue for advertisers	29%
Video is a growing source of new customers	27%
Other (please specify)	2%

Q37 - What would keep you up at night if you were / are operating a video platform? (Select all that apply)

Meeting subscribers' expectations with regards to video platform performance and functioning	45%
Meeting subscribers' content demands	42%
Speed and success of deployment of new features/functions/platform components	32%
Budget restrictions (including video platform total cost of ownership)	29%
Subscribers churn very easily	29%
Lack of skilled video domain experts or engineers	25%
How to decide what technology fits best to my needs	15%
How to increase platform performance visibility internally	13%
Internal complaints about the effects on brand value	13%
Other (please specify)	4%

Q38 - What are the most important reasons for you to consider outsourcing your video distribution? (Select all that apply.)

A matter of business case	37%
Wanting to reduce and control costs of operation	31%
Increase efficiency of specific time-consuming functions	31%
Risk mitigation	30%
Looking to improve company focus	30%
Free up resources	25%
Other (please specify)	3%

Q39 - Do you have enough budget for the needed video delivery improvements? (Select all that apply.)

No budget available as we have other priorities	26%
No, my budget is not enough to operate effectively	17%
Yes, we have enough budget to operate, but not to innovate	17%
Yes, but we will not lead innovation, we will only follow based upon proven success	15%
Yes, willing to generate operational margin from within to innovate	15%
Yes, we can both operate and innovate	15%
No, investment needed - no improvement necessary	14%

Q40 - How important is automation for your video and tv business?

Very important today and tomorrow	33%
Very important today, because we do not have enough labour resources	25%
Very important today, but we still have sufficient labour resources	12%
Not important today, we have other solutions	11%
Not important today, but very important in the future	9%
Not important at all	9%

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IOT

Q41 - What do you regard as the most interesting use of IoT (Internet of Things)? (Select all that apply)

Healthcare	61%
Connected Vehicles	60%
Sensors that sense microbial awareness in cities.	32%
Prosaic-sounding things (connected lights in buildings, etc.)	29%
Other (please specify)	10%

Q42 - Which technologies in automotive IoT is your company most interested in? (Select all that apply)

Fleet management	45%
Connected cars	44%
Predictive maintenance	39%
Autonomous vehicles	34%
N/A; Doesn't apply to my work	13%
Other (please specify)	2%

Q43 - What are the biggest challenges delaying or stopping engineers, and businesses from adopting and/or developing IoT applications, particularly in the Telecom or Automotive Space? (Select all that apply)

IoT Skills Gap	49%
Security	48%
Data Accessibility	29%
Poor Data Quality	25%
Predictive Analytics	23%
The Data-Scope Is Too Big	23%
Other (please specify)	4%

Q44 - What is the biggest risk(s) associated with the Internet of Things? (Select all that apply)

All of the above	42%
Security	36%
Data privacy	25%
Lack of resources/knowledge	19%

Q45 - What do you consider the biggest challenge(s) for IoT adoption in your organization? (Select all that apply.)

Return on Investment	50%
Cybersecurity	48%
Lack of Resources	32%
Change Management	22%
Asset Management	13%
Other (please specify)	3%

Q46 - What types of information solutions does your team need to more effectively/efficiently do your job? (Select all that apply)

Courses/Webinars	52%
White papers	49%
Standards	43%
Research papers	39%
News/Blogs	20%
Parts/Components	17%
Books	15%
Other (please specify)	4%

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OPEN RAN

Q47 - When do you plan to start deploying Open RAN commercially?

Already deploying	14%
In 1-2 years	23%
In 3-5 years	20%
In 6-10 years	5%
More than 10 years	0%
Not planning deployment	39%

Q48 - What best describes why you haven't already deployed Open RAN? (Select all that apply.)

Unsure of overall TCO	25%
I don't think it is ready to meet my requirements	23%
System integration concerns	20%
Security concerns	18%
Lack of Open RAN standards	17%
My preferred vendor doesn't recommend it	6%
N/A or I'm already deploying Open RAN	27%

Q49 - What do you believe will be most critical for Open RAN security? (Select all that apply)

Incorporating well-defined, telecom-driven security standards from 3GPP and ORAN	51%
Leveraging proven IT security best practices from other industries	32%
Leveraging solutions from third-party security vendors	31%
Alliance	27%
Hiring the right skillsets from outside of telecom	27%
Others (please specify)	1%

Q50 - What are the top driving factors in your decision to deploy Open RAN? (Select all that apply.)

Lower cost	36%
Increased opportunity for automation	30%
Improved time to market	26%
Supply chain diversity	23%
Increased innovation	23%
Competitive pressure on existing vendors	22%
N/A or I'm not planning to deploy Open RAN	28%

Q51 - Which AI/ML-driven next-gen network benefits most appeals to you as part of an Open RAN deployment?

Zero Touch Provisioning for cell sites	23%
RAN Intelligent Controller (RIC) functionality	21%
Traffic steering capabilities	18%
Advanced resiliency features	12%
N/A or I'm not planning to deploy Open RAN	26%

Q52 - What are the biggest inhibitors to Open RAN market success? (Select all that apply.)

Immature ecosystem	48%
Lack of needed skillsets	33%
Incumbent vendor reluctance	32%
Too complicated to manage	27%
Too much risk	22%
Unproven	21%
Other (please specify)	2%