Are Telco's Big Players Ripe For Disruption?

Executive discussions on the state of the market, disruption and innovation

A TelcoForge Leaders' Meeting Report

June 2025

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TELCO FORGE

INTRODUCTION

TelcoForge is holding monthly meetings mainly for C-level and SVP-level professionals from as diverse an array of stakeholders as possible. These meetings take place under Chatham House Rules to enable senior professionals to speak frankly. However, we capture the anonymised ideas and outcomes for the wider industry to digest and act upon.

During the last few months the Leaders' Reports have highlighted some of the dissatisfaction and structural problems prevalent in the telecoms market. Additionally, the recent 6G FORGE event emphasised a variety of changes in outlook towards key structural elements of the market .We will summarise those discussions in a separate upcoming report as well as through articles on the TelcoForge website.

As a result, in May's discussion of key issues, we focused on some fundamental questions facing the industry:

- Given a combination of dissatisfaction with the status quo and innovation in technology and business, does this set up national-scale mobile telcos and/or the major global network equipment providers to face a period of disruption which will see them unseated or transformed?
- Are these major players able to stay ahead of developments, for example by disrupting themselves?
- If not, where is disruption likely to spring from?

In May 2025, over the course of two one-hour calls, around a dozen executives from different parts of the industry and different continents shared their insights.

EXECUTIVE SUMMARY

Disruption in the telecoms industry is a persistent theme but understanding its real dynamics remains elusive. This TelcoForge Leaders' Meeting report explores whether the major incumbents in telecoms - national-scale operators and global equipment vendors - are at risk of being unseated or whether they will remain dominant through innovation or inertia.

Disruption occurs not when incumbents innovate, but when smaller players enter underserved markets and gradually move upmarket. In telecoms, this is playing out across multiple vectors—underserved consumers, overlooked enterprises, rigid business models, and opaque standards.

Most consumer markets are saturated, and ARPU is flat or declining. Meanwhile, many telcos have struggled to transition well to enterprise markets. These cracks create opportunities for disruption from agile players offering tailored, simpler, or more cost-effective solutions.

Innovation in telecoms is stifled by deep structural bottlenecks. Regulatory frameworks, spectrum licensing regimes, overleveraged carriers, and risk-averse corporate cultures all act as brakes. Some of these have shielded major players from new entrants, but it also limits their opportunities to innovate.

Complexity, both technical and organisational, is a double-edged sword. While it provides rigour and reliability, it also delays decision-making and obstructs innovation. The layering of technology has created a "knowledge wall," often forcing telcos to rely heavily on vendors.

Several traditional "moats" that have protected incumbents are weakening. The SIM card as the primary point of customer ownership is being challenged by eSIMs and new identity models. Spectrum, once a reliable gatekeeper, is becoming more open to innovation. Open networking, Kubernetes-based architectures, and open-source communities are also reducing dependency on legacy vendors.

New players, such as private network operators, MVNOs, and IoT specialists, are exploiting niche markets with lean models and tailored services. Satellite providers like Starlink are extending connectivity to previously unreachable areas. While these are niches today, there is scope for disruption from these quarters over time.

Telecom's innovation challenge is less about technology and more about business models, capital, and institutional inertia. The features of the industry that protected it are also undermining its opportunity to innovate out of its current situation. The industry must now ask: who will seize the moment to build something new—and who will be disrupted by those that do?

THE DISRUPTION PROCESS

"Disruption" is perhaps the most overused (and misused) terms in business today. Here's a reminder from the originator of the term, Clayton Christensen, about what this actually means:

"Disruption" describes a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses. Specifically, as incumbents focus on improving their products and services for their most demanding (and usually most profitable) customers, they exceed the needs of some segments and ignore the needs of others.

Entrants that prove disruptive begin by successfully targeting those overlooked segments, gaining a foothold by delivering more-suitable functionality, frequently at a lower price. Incumbents, chasing higher profitability in more-demanding segments, tend not to respond vigorously. Entrants then move upmarket, delivering the performance that incumbents' mainstream customers require, while preserving the advantages that drove their early success. When mainstream customers start adopting the entrants' offerings in volume, disruption has occurred.

Harvard Business Review 2015

It is not controversial to say that there are some very strong incumbents within the telecoms world, both as national-scale operators and as equipment vendors.

In the coming report our experts will share their views of where there are populations which are either not served by those incumbents, or who would benefit from access to simpler, cheaper services.

We will also explore the double-edged sword of innovation. While 'disruptive innovation' is a useful marketing tool, whether any given technology or business innovation proves to be disruptive or not is less about the innovation itself and more about who uses it. However, the ability to innovate - whether to sustain existing industry leaders or disrupt them - is the lifeblood of most industries. We will investigate bottlenecks to either creating or leveraging innovation and possible solutions.

Finally, we will explore some of the likely avenues that disruption might follow, based on the proposition that some of the 'moats' that have protected incumbents in the past are either weakening or look likely to over the next few years. In many cases this is a by-product of innovations designed to help incumbents sustain their businesses or access new customers. Participants in the conversation were presented with a thesis that these competitive 'moats' include the cost to launch a new telecoms service provider; difficulty of access to usable spectrum; inaccessibility of potentially-disruptive insights; and use of the SIM to 'own' the customer.

PRESSURES ON THE STATUS QUO

CONSUMER MARKETS

"5G was was about trying to broaden the whole telco market into the Internet of Things and and digital transformation and. Unfortunately, I think the problem is that the carriers are very consumer-centric."

So came one comment, underlining the history in telecoms providers of offering services to consumers en masse. For many national-scale providers, especially in the mobile domain, service provision to consumers had been the backbone of their initial growth. However, as one participant summarised:

"We have pressure from the government to provide a a cheaper, lower price of network services. Also, our numbers of subscribers are almost saturated and it's very difficult to have additional subscribers… We are struggling about how to increase the ARPU; that is also challenging. We need to provide more interesting services to customers in addition to the network services, and we are trying to develop new services, interesting and attractive services."

That viewpoint comes from an established market, and it is worth bearing in mind that there are still billions of unserved or underserved consumers globally. However, there reason why those markets are underserved is usually because of the difficulty in delivering services in an affordable way both to the consumers and the telcos; so there is a parallel ARPU challenge in those markets. Accordingly, there are opportunities for disruptors to serve these customers.

ENTERPRISE CUSTOMERS

While there are telecoms providers who have made a success of providing enterprise services - especially B2B specialists such as Tata - many telecoms providers globally have struggled to serve customers in SME segments. Where a customer is large enough to merit a dedicated team to serve them, there has usually been an effective engagement, but ironically scaling that into a process equivalent to B2C has not been very effective. As a case in point, conversations about 5G prior to launch focused on automotive, healthcare and other outcomes that were about B2B. However, it has mostly been hailed for a rapid rollout across consumer markets.

"Fundamentally they don't know the (enterprise) customers, they don't really understand what the customers want," commented one expert. "Enterprises want more than connectivity to make a business case. Most of them want a business outcome that Increases revenue, decreases cost or does something that they can't do. And the the carriers don't know how to make that case."

Indeed, this is a perspective echoed among service providers themselves:

"We have identified some kind of "Great Wall" between our industry and the vertical industries. We are using different language and different cultures. But 5G is now a very good starting point to develop a new enterprise business,.to develop winning services for 6G. So now we are making a great effort how to explain 5G. How does it improve your business? How does it improve the efficiency of your business and of vertical industries?"

Some might say that making the distinction between telecoms and 'vertical industries' in itself creates a divide. That aside, it is clear that there is an underserved market here and an opportunity for disruption. However, incumbents are working to close this gap and are experimenting with how best to engage and support enterprise customers.

Image by Peggy und Marco Lachmann-Anke from Pixabay

"Industry people don't care about the physical problems. They don't know - they don't want to, actually, so that issue has to be solved by ourselves in the ICT industries. The current situation is little bit confusing for industry people. They complain about the frequent updates to 3GPP specifications. They complain about which release should be deployed in their factory, in the market or something, so that maybe we should reconsider how frequently we release 3GPP specifications."

VENDORS

Major network equipment vendors have two methods to protect themselves from being disrupted.

One is simply the ability to bring innovations through the standards process for a global audience.

The other is the role of vendors in selling expertise along with products. The major network vendors all supply managed services deals. While useful in the short term for supplying skills, it also creates a dependency which serves as a disincentive to change suppliers.

As well as the technology update, a change now involves renegotiating a supplier contract for operational expertise, and possibly changing the staffing of a Network Operations Centre and/or Service Operations Centre along with the associated retraining involved, managing a handover and so on.

Otherwise the operator needs to hire and train their own staff, a process which - given the complexity of current networks with elements of physical and network engineering, IT and AI - is liable to be long and costly, and which also imports risk which would otherwise lie with the contractor company.

One of the participants described the shock of discovering this situation at a tier 1 operator they joined:

"Oh my God, just project managers, vendor management, that's all it was. Vendor management. And then every time there's something technical, it's got to be "Ericsson or Nokia, tell us, come help us out!" And that is the problem, right?"

While this does help the major vendors today, there are certainly indications that their services are not working well for all potential customers:

- Open networks ecosystem adoption in private networks, in-building, in-fill networks etc. Companies such as Ontix and Airspan are built on open network technologies, while large companies such as Kyocera are creating new alliances for open networking elements, While this is taking place in particular niches today, that is what we would expect from early-stage disruption.


Image by Mailme6 from Pixabay

- Interest in building software-based network architecture in Kubernetes breaks the hold of major vendors in two ways. First, it's a software reflection of open networking paradigms in network hardware. Secondly, it goes a long way towards democratising expertise. While network-specific expertise tends to be in short supply, programmers and experts in Kubernetes are much more broadly available. This means that creating in-house capability for building and managing networks using this architecture is more straightforward and allows service providers to reduce their dependency on major vendors if they see fit. We addressed some of this in our previous report.

- The adoption of open networking and open source elements reflects a third vector for disruption, which relates to problems with the standards process. We will explore this in more detail later in this document.

BOTTLENECKS TO INNOVATION

Disruption of the status quo can be countered by sustaining innovations, those which help maintain an incumbent company's hold on their customers. However, both disruption and sustaining innovations require a means to bring that innovation to market.

"We're in this straightjacket we're trying to break out of... In the last four or five years, the number of companies that I've come across who've had just some amazing ideas about what they want to do! And there's no conduit for them."

For those that would argue that there is a huge amount of innovation in the industry - that is also true, but the innovations tend to be in technology and, to a degree, in the operating models that support them. Business models have seen less progress, particularly in B2C markets where a handset and a data plan have been the norm for almost two decades.

Bear in mind that the telecoms industry has seen their business model suffer during this time from external pressures and rapid innovation. WhatsApp, Kakao, Facebook Messenger, QQ and others have largely taken over consumer SMS markets in that time: in the UK, for example, revenues from consumer SMS usage have dropped from £2.47bn in 2011 to £0.42bn in 2023. None of those proprietary systems is interoperable and global in the same way as SMS, but their capabilities and speed to market compared to the GSMA-organised RCS has led largely to a surrender of this once-lucrative market.

So if a lack of monetisable innovation is the surface problem, what underlies it?

STRUCTURAL BOTTLENECKS

"I would say that we need to fix the underlying control mechanisms," one participant noted.

"I would point the finger at standards, government regulation and the motivations of the commercial sector, which aren't always pure. Those problems are highly interrelated, because commercial sector motivations lead to corruption, graft, and all the other things that we certainly are seeing in Washington right now."

There is another reason why national-scale telcos in many countries are unwilling to pursue significant commercial innovation:

"I don't think you can do that without a significant change to the infrastructure that we've got, and carriers are not incentivised to do it. They're totally overleveraged anyway. They can't see a return fast enough to be able to do it."

While this sounds like a separate problem, some of the structural underpinnings of the telecoms industry go towards both the incentive structure and the financial situation of telecoms service providers.

For example, the regulatory structure in many countries is built on service providers competing with each other for spectrum and competing to build out network infrastructure; and at the same time protecting consumers from drastically rising costs. As networks densify this creates an imbalance between the cost and the opportunity.

There have been efforts globally to change the way that spectrum allocations might work in future. However, there are other incentives at play when it comes to the way the playing field is laid out:

"Licensing fees are going up because it's a tax. I can't imagine the Trump government eliminating anything like that, nor any of the other developing world governments. They love that license fee revenue, but if we can get off the license fee treadmill we should. If we can go to some kind of an unlicensed arrangement that is trustworthy, that would be useful. Unfortunately unlicensed things are never trustworthy in my view."

It is worth noting that there are half-way houses between the poles of an unlicensed free-for-all and the current system. Discussions about different models have raged for almost three decades (see this piece from 1997 for example). It is possible to set up safeguards so that access to unlicensed spectrum can be done more securely, for example only by properly authenticated and permitted entities. Meanwhile licensing models that enable more flexible access, such as paying for local rather than national licenses, or a usage-based model, or providing free licenses to specific companies, can reduce those structural pressures.

"I think we probably need to take a look at rejiggering the spectrum plan. I would like to see more trustworthy uses of unlicensed spectrum and I'd like to see that expand a bit."

Photo by RDNE Stock project

THE PROBLEM OF KNOWLEDGE

We have already touched briefly on the problem of knowledge - namely, that there is so much to know in the current telecoms environment that even knowing what there is to be known can be difficult.

This challenge has grown significantly over time, in the fixed domain but especially in mobile where subsequent generations have required different knowledge and skills; more so because new generations overlay older ones but rarely replace them. This has created a compounding of the knowledge required to successfully manage a telecoms network, its services and customers. Network engineering, software engineering, cloud-native engineering, radio and now AI all overlap to create a demanding and complex environment.

What is more, despite the fact that telecoms providers depend on using industry standards, their networks are all different from each other owing to their unique histories, vendor selections and stage of journey - whether they have shut down 3G or not, how far through a journey to open, software-based networking they are, their systems and service architecture and so on. As a result, somebody with an encyclopedic understanding of one service provider's network might struggle with another's.

Outsourcing the operation of the network and passing the risk of failures to a third party is a sound business response in this situation. However, it can also remove the agency of the client in situations where the relevant knowledge and skills base is not kept in-house and maintained up to date.

"Let's say 6G will be fragmented and there will be this memo out of the government saying "Okay, we have our 6G strategy; what do we have to do?" Who do we call? The incumbent? Okay, but who are *they* going to call?"

Photo by Kenny Eliason on Unsplash

COMPLEXITY

"Most people are not very technical and one of the things our industry is very good at doing - or very not good at doing - is making things complex."

Complexity goes along with the problem of knowledge. Over the past few decades the industry has tended to layer new technologies and capabilities on top of old ones rather than replacing them, and then trying to make the experience seamless across them.

Additional complexity creates friction to change, not least in terms of discovering problems that need fixing. This happens not only in terms of technology; complexity within organisations can be a source of friction too:

"I was involved in Chile with a network that cost $440m to deploy... They couldn't start launching commercially because the voicemail service provider didn't receive the final acceptance test. They were holding up an investment for $440m because of a $10,000 test. I called the person and he said "I can pay $10,000, no problem. The problem is that to get reimbursed for it I have to report it and it will go to the management team.".... This was not a technical issue, it was a commercial issue."

In great part this complexity is also inherent in the nature of the industry and its diverse set of stakeholders. National and local governments, global coordination through political units like the ITU and industry bodies; law enforcement and defence; investors and shareholders; equipment vendors; competitors; consumers and their advocacy groups and more all have their own priorities and methods to exert pressure. Navigating through that is inherently complex and tends to create a drag effect on decision-making which, for example, many app developers don't face. As a participant pointed out,

"There was a time when the government wasn't even going to allow cellular networks to exist because of national security. I think it was Schlumberger or some company that perfected SIM card technology to allow us mere mortals to have a wireless communicator in our hands. So you have to have this appreciation that so much of this is controlled by really arcane standards and really arcane goals. It helps you realise this is far more about building collaboration between groups to solve the end goal."

THE PRODUCT OF THE COMPLEX

The reasons behind having a complex environment are in themselves unobjectionable - unlike providing toasters, for example, there are societal, national security and economic impacts from telecommunications.

However, one participant shared the following story, which demonstrates the stifling impact of cumulative complexity:

I used to work for an Open RAN start-up…. When the company started, it started with the same question of “Why is all the infrastructure so complicated? It shouldn’t be that complicated,” so we built a simple system and it worked. We went to different operators and trialled it and they’re like “Yeah, it works - good!”

But then…

In an indoor system with Wi-Fi, things are pretty simple. You might say “No, that’s not the case!” but when you go outdoors with big deployments you have *all* these small, small things. What about handovers? You have to take care of roaming. There are all these different kinds of physical and cybersecurity.

Then you have multiple frequencies. It’s so with Wi-Fi, of course: 2.4GHz, 6GHz, 6GHz, now maybe 7GHz. But with cellular there’s all these different bands, but you have to deal with them and put them together. So you have carrier aggregation in all these different combinations, and different phones use different combinations. So the network has to know which phone or device is which, what combinations it supports, and what are its capabilities so that regardless of what the device is we can support it.

In the end there was just so much complication that we realised it was a never-ending project. The list of things keeps on growing. Every operator will have a completely different set of requirements. They have different spectrum, they’re in different parts of the world with different physical environments, different regulation. It just kept going on and on.

IThe start-up was well funded and delivered some genuinely fresh and valuable ideas, but readers can feel the impact of this experience on the speaker.

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One might view this as a problem as well as a barrier to innovation, but the rigour involved in telecoms is also a strength. While there may not be the speed and flexibility of an app developer, the demands placed upon services before they launch give some guarantees.

“You can have plenty of people who are bored, sit down to code for two or three days and show something as a PoC. As Steve Jobs said, try to productify this. Try to put it in a continuous product roadmap, with security, maintenance, scalability and interoperability; *then* come and show it to me.”

LIkewise, the complexity involved in technology specifications can also be a strength and an opportunity. As a participant commented,

"In telecom there are specified protocols, interfaces, KPIs, service availability, service reliability, mobility; it is all specified for different services."

This offers a great opportunity for innovators in some regards, insofar as there are clear directions for how to deliver services or capabilities which will integrate seamlessly with telecoms networks all over the world... in theory.

Unfortunately that theory is not accurate in practice, owning to problems in:


Photo by Eliott Brown on Flickr

TRANSPARENCY

"If you go back even to Release 15, in 3GPP of course you have traditional telcos but now you have new companies who are far from traditional. They have to have the time, like me, to go through the 1,000 pages of the specification and find this nugget that can launch a business."

In other words, while the specifications could be very helpful, they are *mainly* going to be helpful to an extremely small population; namely:

- Those people with the time and ability to wade through specifications, understand what they mean, interpret them in a commercial light and then have the desire and ability to do something with that.
- The people involved with creating the specifications in the first place, who understand what they are putting in and why.

In some ways this is reminiscent of priests in the Middle Ages. While other people could in theory learn to read and write Latin, in practice most people needed a caste of people who could intercede between the divine word and the commoners. Not only that, but complexity can be (and is) used to obfuscate opportunities to innovate:

"In Release 18, user identity has changed in 5G Advanced. Why? Because they're providing access to localised services without a subscription to the operator that is offering those services.. In the December preliminary report it mentioned mobile network operators, service providers *and service operators,* which indicates something. You have that wording from the Release 18 specification from 2021 initially and from the approved version in June 2024. Then after I got in contact with 3GPP SA2 it opened Pandora's box. They took away reference to service operators. But if you look in the specification for service-enabled application layer architecture, the actual capability remains even now."

Of course, the understanding that competition could be managed differently is very much in the public consciousness.

“The open source movement is really important in this space, so we don’t rely on the Nokias and CIscos of the world to be our only source of innovation. How do I build a $1.00 transceiver that’ll last 10 years on an AA battery? That’s the kind of stuff that can be innovated as an open source project. And there are software analogies too. How do I integrate agentic AI into an implantable or wearable device? Open source is a way to get them done in a way which means we don’t end up with another Nvidia with huge control over everything AI.”

While open source certainly has its detractors and its own challenges, as organisations in this space have demonstrated, the transparency and replicability of what is set out makes this a potentially interesting source of disruptive innovation. What might lead to the biggest changes, though, is the difficulty of protecting innovations for one company with patents. As ever, whether that results in disruption or in supporting a new status quo remains to be seen.

SCOPE FOR INNOVATION
(AND PERHAPS DISRUPTION)

As mentioned earlier, some of the ‘moats’ which have protected major telecoms providers from being disrupted are showing signs of being eroded. This tends to show itself in creating avenues for innovation; which is, of course, something which is desirable in itself for the industry. Over the following pages we will explore several of these, both with comments from our panel and reference to activities in the wider world

Photo by zhang kaiyv on Pexels

OWNING THE CUSTOMER

The question of who has the direct billing relationship with an end-user has been a central one for B2C telecoms for decades. Through the use of an on-device SIM, one telecoms provider has been able to act as the go-to for the customer relationship, billing, authentication and so on. As a way to ensure continuity of revenue in a B2C environment, telcos have pushed hard to retain a SIM card even though eSIM has been available for years: this article sums up the frustration felt by an informed member of the public at such equivocation.

Meanwhile, we know that people don't necessarily work with just one operator on one network.

- Roaming has always been about enabling service regardless of operator.
- The dual-SIM phone is an acknowledgement that people want billing relationships with multiple providers depending on situation, as are roaming SIMs.
- eSIMs have been widely adopted in IoT devices without the controversy attendant upon those for mobile handsets, with the ability to provision them and re-provision them seamlessly.
- Apple has been operating on eSIMs since the iPhone 14, although it's still a relative outlier.

All in all, this calls into question whether we should equate ownership of the eSIM with any kind of 'customer ownership'.

In most countries, Know Your Customer rules underline the importance of authentication of devices, and the relationship of those devices to a human being, as a way for example to track fraud. The SIM has tended to be proxied for a person as a useful shorthand, but over the past three decades other forms of authentication have arisen which operate well, for example in digital and financial services.

"The SIM card is based on asymmetric authentication, based on a key held in a central repository by the telco and one on the device. There's a central point of failure there, no matter how many firewalls it's behind. If you're able to figure out a mechanism to build more of a symmetric authentication system where we don't need keys to be centralised, you won't have the issue that happened to SK Telecom a few weeks ago [a breach of their centralised key repository}. We can essentially completely decentralise in 5G and ultimately 6G networks."

The speaker was obliquely referring to their own work, but there are many activities afoot to provide alternative methods of authentication and identity. This - combined with the implications of the Release 18 innovations mentioned on page 13 - show that there are cracks available for disruptors to lever open this market.

There is a second vector for disruption, which is much more imminent.

"LEO satellites are coming in a big way. If you had asked me five years ago could Elon Musk have 7,000 Starlink satellites in obit, I'd say "Hell no - maybe 100". But they're up there, they work and you can reach them from terrestrial phones. That is a game-changer for everything beyond the suburbs."

Game-changer indeed; separately, another participant mentioned the same thing.

"I met some former analyst colleagues... They live on different Greek islands and they were talking about how life used to be difficult for them before. On these Greek islands you didn't really have any way to get Internet. They had to rely on satellite Internet, which used to be expensive, unreliable, lots of latency; and then came Starlink. Starlink is so undersubscribed on those islands they get 100 MBPS on downlink and really good uplink. They were talking about how awesome it is like they're trying to sell me Starlink....When you hear things like this you realise that, just because I live in a city and have always relied on fibre, I haven't understood how valuable this is."

In the USA and some other countries, satellite direct to mobile is being operated on licenses which essentially allow it to function as an extension to cellular services for T-Mobile, Vodafone, Telefonica and others. However, we might see this almost as a second phase of disruptive evolution in space-based communications. Satellites have long been used for delivering services in places where cellular connectivity is absent: maritime, airborne and desert settings, for example. With their insertion into more mainstream customer bases and geographies, there is scope for disrupting the market. Certainly the relationships between cellular and satellite providers, end users and device manufacturers are not set in stone, as this TechUK article points out.

However, that scope will depend on...

SPECTRUM ALLOCATION AND USAGE

Spectrum allocation, licensing, coordination, sharing, pricing and more is a huge field. For example, satellite players will only be able to disrupt cellular players if they are allowed to use the right kinds of spectrum to offer their own services. If not, then innovations in non-terrestrial capabilities will serve to sustain rather than disrupt the current market.

"Another disruptor - way out there, but still worth looking at - is a way to get a bandwidth of hundreds of GHz of signal without trying to license that from any government or trying to build radio towers. That's free space optical communications using Wi-Fi technology. Instead of worrying about radio technologies which are licensed, regulated and problematic lots of ways you just go to shooting lasers through the air. It's a really good thing if certain technological challenges can be met. They've been thinking about them for 20 years and it's still 10 years away - and always has been - but keep your finger on that pulse because sooner or later microwaves are going away in favour of optics. Optics are better in almost every dimension."

While spectrum is still going to be fundamental - and telcos' spectrum purchases are still a valuable asset which needs to be leveraged - it is worth considering that the majority of data today is carried over fibre and Wi-Fi from indoor uses. While there are growth opportunities outdoors these are liable to be more from new device types such as vehicles and IoT applications, at any rate unless and until wearable AR glasses enable us to consume more data on the move.

There are a wide variety of discussions, proofs of concept and sandboxes experimenting with different forms of spectrum sharing, permitting and usage. With the increasing prevalence of AI there is scope for spectrum management to be much more dynamic, making ad-hoc decisions on how spectrum is managed to optimise the experience of users. The argument is that licensing was initially designed to help create clean spectrum environments to deliver services as well as possible. Today this can be managed on a much more granular level.

Whether this facilitates disruptive business models or services in itself is unclear. However, there is at least an awareness that spectrum regulation can sustain greater innovation, with sandboxes in India, the UK, Brazil and elsewhere highlighting a will within countries to leverage this as a strategic differentiator.

A 'CAMBRIAN EXPLOSION' OF TELCOS

While we might not have seen titans of the industry falling, it is certainly true that there are more players operating at the fringes than ever before, providing specialised services for in-building, enterprise, private, neutral-host or other requirements, as well as MVNOs targeting particular segments.

"There's a new breed of operators emerging. They're not your traditional telco. These are enterprises deploying private networks. They might be local, they might be regional, and some of them are international in the sense that they might have sites in many cities, many countries. They're essentially building a global network of small networks."

In itself this might be considered to offer potential for disruption. Without national-scale responsibilities many of these service providers fly below the radar. They reduce complexity by operating in specific environments and they aren't burdened by legacy architecture or networks. They tend to operate using open networks. They offer a simplified and specific set of services to customers who would not be served well by national-scale providers. So these players do fit the profile for potential disruptors.

"There are 200 billion IoT devices by the end of the decade, and certainly we want to connect them also. Maybe not through 6G cellular, but some kind of mechanism. And I think there are opportunities for growth and disruption for whoever can do the dollar-a-month service to a dozen IoT smart home devices so I don't have to mess around with my Wi-Fi router to connect them."

APPROACHING ENTERPRISE DIFFERENTLY

It's fairly clear from consecutive MWCs that service providers are giving their attention to enterprise customers, and particularly in 'verticals'. There is an argument that the national-scale players should be well-equipped in some ways to support them, by providing capabilities that extend beyond pure connectivity (but also include it):

"An issue that became very obvious during the CBRS Alliance's work was that, to support autonomous use cases or anything to do with a machine-based network, it's more than connectivity that's needed. There's a lot of external data, whether that's situational awareness or you-name-it, and it needs to be secure, available and synchronous. And it's just not available. People are trying to work around it with autonomous vehicles, making them self-aware and burdening those vehicles like you wouldn't believe with cost."

Indeed, in 2025 Ford acquired Kopernikus Auto, a start-up developing exactly this kind of situational awareness using remote sensors (potentially Integrated Communications and Sensing). Their aim is to guide cars that are not autonomous as if they are in specific situations - for example, for parking or in known busy areas.

As we have seen with many IoT services, the concept of 'customer ownership' in this environment is rather different from the B2C context. Rather than prioritising access to a specific physical network, the bill payer is focused on receiving a service for their devices.

"We need to figure out how to create a different type of service provider, one that's over-the-top. One that actually provides all of the data and all of the other pieces - whether it's autonomous vehicles, drones or you name it - all of the things they need from a network that would actually make it valuable to enterprises, because connectivity pure and simple isn't enough."

Could the national-scale providers develop this capability? In theory, absolutely. Indeed, in many respects the established players are the only ones who have some hugely important data.

There are already dedicated enterprise-focused MVNO enablers such as Arkessa and Effortel who are supporting capabilities for enterprise customers out-of-the-box. Their strength is the ability to move fast and provide the control to the end client. However, the point about supporting enterprises with the telcos' own data is striking and something which provides an opportunity that can't be replicated by competitors.

INNOVATING ON TELCO DATA

We have seen the enterprise need for situational data to enable smarter capabilities for vehicles. In AI, too, the networks are unquestionably the only players with access to information on the state of the network, both over time and at any one time.

"For AI, and especially what's called physical AI, which controls real things and monitors real things, cellular networking and networking in general is a very important enabling technology. It makes the connectivity work and builds the physical AI infrastructure that we're talking about.."

The converse is also true:

"We could imagine AI engines doing security audits on the network so that I never get the stupid "You're qualified for healthcare!" spam calls I receive three times a day currently. AI could say "That smells like spam, I'm not going to make the phone ring." That would be a welcome service."

Telecoms providers have been loath to share live network data, understandably. The industry is used to keeping network data confidential for fear of running foul of GDPR or other compliance issues, opening up security breaches or just avoiding any PR embarrassments. In a conservative industry, showing what's happening under the hood is not always a benefit.

However, live network data is an invaluable tool - for example, without training network AIs on actual network data, how are they meant to learn the correct lessons and behave appropriately?

People are starting to find ways to make this happen in an ethical, secure manner: AI-RAN Alliance chair Alex Choi recently posted on this very topic highlighting a process for training AI.

"The lack of infrastructure and data - whether that's digital twins, data exchanges, you name it - that's what we're missing that would allow that next real wave of innovation to occur."

CONCLUSIONS

There are many reasons why change in the telecoms industry - especially commercial change - takes a long time if it takes place at all. Much of this serves to incubate major players from disruptive entrants, but it also serves to stifle innovation that would support them.

As the industry slowly searches for new avenues to innovate it opens up the risk of disruptive innovation.

There are some areas where there is change taking place and others where there are reasons for optimism, provided the current trajectory continues.

However, there is a risk that the knowledge necessary to create that innovation is unavailable or indecipherable to the people who would most benefit from changes to the status quo. There are some key areas where greater transparency and greater skills sharing would add huge value.

"I think the key is to create opportunity... and I just think that it's not a technology problem, because that's all there. All of those ideas are there. It's a business model problem. It's a capital infusion problem. If we can figure that out, you could just innovate six ways from Sunday if you really wanted to. But until we figure that out you're going to see innovation, but it will be down very narrow channels."

"We're not going to boil the ocean today or tomorrow, but what we can do is lay foundations, establish attitudes, and - most importantly - ask the right questions."

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The TelcoForge team would like to thank the senior executives for their time and insights making this report possible.

We look forward to many other constructive insights.

Leaders' Meetings take place monthly on an invitation-only basis. Executives on the invitation list have no obligation to attend but may propose an alternate participant if they are unable to join.

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