The state of 5G

Capturing more value from telecoms' connectivity services

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The arrival of 5G promised a revolution in telecommunications for carriers and, most importantly, their customers. Ahead of 5G's launch, marketing materials promised blindingly fast speeds, ultra-low latencies, and much higher bandwidths. These developments were expected to unlock new technology innovations that would enable a renaissance in consumer applications and services.

With telecom evolutions typically running for five to seven years, we're firmly mid-cycle on 5G, which first rolled out in 2019. Yet 5G's promises have mostly yet to be delivered. The 'killer' apps—data-intense uses like video and 3D-graphics processing, immersive AR/VR/XR (augmented/virtual/extended reality) experiences, mobile multiplayer gaming, autonomous robots, and connected vehicles—have had limited adoption, haven't yet fully emerged, or have turned out not to require 5G after all. Customer adoption of 5G remains low, with **the GSMA predicting** that at the end of 2025, 5G will still account for only a small share (25%) of all mobile connections—up from 8% in 2021, but far behind 4G, which will still command 55% of connections.

For telecom operators, which have invested an estimated US$275 billion in the rollout in the US alone, **according to industry body CTIA**, this lack of enthusiastic customer migration means returns on 5G investments have so far been underwhelming.

So how can telecom companies capture more of the value their 5G investments were meant to create?

The promise of 5G

5G promised improvements for providers and their customers in four key categories:

Technology

- **Infrastructure rollout:** Broad availability of high-performance networks across urban and rural areas

- **5G standards:** Well-defined and universally accepted technology and interoperability standards for Gbps/ultra-low latency communication networks

- **Migration:** Seamless sunset of 3G networks, and evolution of 4G subscriptions to 5G

- **Open RAN:** New architectures supporting non-proprietary components

- **OSS/BSS evolution:** New and improved software architectures, business processes and software to deliver better customer experience and improve business efficiency

Services

- **Mobile broadband:** Much higher data rates and lower latencies to improve customer experience for widely adopted consumer applications like streaming video and gaming

- **Enterprise 5G:** Evolution of telecoms' business services to empower businesses to operate faster, do more and improve efficiency

- **FWA:** Viable fixed wireless access (FWA) broadband services for the home as an alternative to cable and fibre landline internet services

- **Private networks:** Private 5G networks enabling enterprises to deploy much local networks that are more capable of supporting new use cases

- **IOT/MEC:** Connecting billions of devices and intelligent things amplified and enabled by mobile edge computing (MEC), enabling secure, intelligent, efficient operations of machine-to-machine networks

- **Metaverse and other 'killer' apps:** Next-generation services that will drive mass adoption of 5G

Customers

- **Mobile broadband consumers:** Growth in mobile broadband subscribers

- **Enterprises:** Growth in enterprise subscribers to a wider range of services

- **New 5G customers:** Creation and growth of new classes of consumers (e.g., metaverse users) for new 5G services

Monetisation

- New services revenues: Substantial growth in revenue from 5G services

- 5G financial metrics: Substantial improvement in telecoms CSP operational metrics (ROI/ROA, revenue, margin, etc.)

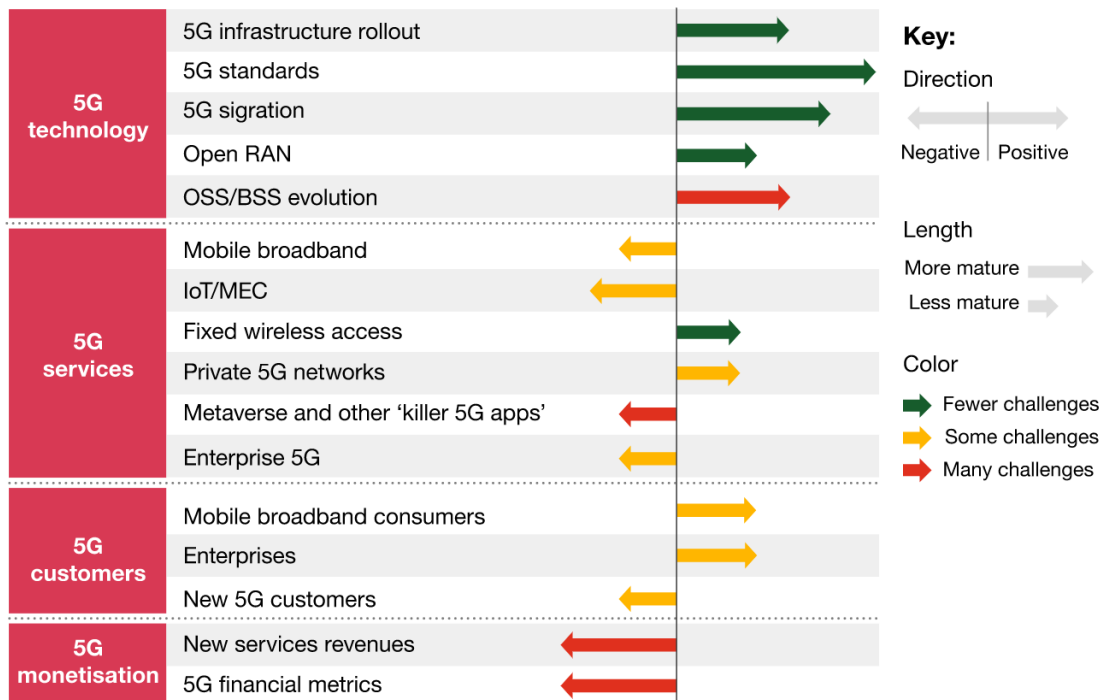As of 2023, the industry is realising these promises at varying rates.

5G state of play: Reality versus customer perceptions

Considering the vast challenge and cost of the logistics of rollout, it should have been clear that 5G was always going to be an evolution rather than a revolution. This was how telecoms approached it internally—working toward a clear roadmap for rollout, much of which is on track. But externally, while customers were sold on the radical future innovations that the speed and quality of 5G connections would enable, it wasn't made clear quite how long it might take for these to materialise.

The Current 5G opportunity

An oveview of the positive/negative direction of 5G-related trends, their levels of maturity, and the scale of the challenges they face

5G technology	5G infrastructure rollout
	5G standards
	5G sigration
	Open RAN
	OSS/BSS evolution
5G services	Mobile broadband
	IoT/MEC
	Fixed wireless access
	Private 5G networks
	Metaverse and other 'killer 5G apps'
	Enterprise 5G
5G customers	Mobile broadband consumers
	Enterprises
	New 5G customers
5G monetisation	New services revenues
	5G financial metrics

Key:

Direction

Negative | Positive

Length

More mature

Less mature

Color

→ Fewer challenges
→ Some challenges
→ Many challenges

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Today it's clear that large parts of the necessary infrastructure rollout have been successfully completed, and the promise of ultra-low latency and high speeds has largely been borne out, with carriers and OEMs demonstrating speeds above 10 Gbps and sub-10 millisecond latencies. Carriers are becoming increasingly proficient at operating 5G technologies from MIMO (multiple-input, multiple-output) to cloud RAN (radio access network) through new packet cores and more, and standards are coming together to enable O-RAN (open RAN).

Indeed, from a 5G technology perspective, it's really only with OSS/BSS (operations support system/business support system) evolution that telecom firms are struggling. But, of course, a failure in operations and business support can lead to a negative follow-on effect in customer experience—a particular challenge given how the initial marketing for 5G may well have overblown its value proposition for customers.

The key thing to remember is that the value telecoms can bring isn't just their connectivity services—it's their connectivity expertise. It's not necessarily the speed of those connections that's valuable; it's the end uses they enable. Telecom companies need to empower their customers with a step-change in service fulfilment and the experiences their services can provide and support.

Carriers are currently making a spirited effort to relaunch home broadband internet services through fixed wireless access (FWA) with mixed success. Delivery on the promise of IOT services beyond connectivity is still immature and fragmented, and most

carriers have not developed compelling IOT or edge services. Killer 5G apps like the metaverse are still yet to arrive in forms that will drive mass adoption of super-fast mobile broadband. This is why today, consumer perceptions of 5G trend slightly negative, with the market still immature—and also why monetisation is the most significant challenge for carriers.

Meanwhile, there are also emerging challenges from other players, like hyperscaler tech companies and cloud service providers, specialist providers and systems integrators. This could prove a significant threat to telecoms' core connectivity businesses—especially for enterprise customers—with hyperscalers in particular being well positioned to gain a sustainable advantage that could transform them into de facto alternative carriers.

Although the challenge is clear, most carriers at this mid-cycle point still have no clear line of sight to improving the return on their 5G investment, or realising materially significant new revenue streams from new services. Until their service mix evolves substantially, telecom firms are unlikely to see 5G drive major new subscriber categories that are financially material.

So how can telecoms capture more value from their 5G investments? The key is to remember that 5G is just one part of the connectivity mix. We think there are three areas telecom firms should focus on to start generating the returns they've been looking for.

1. Target incremental investment on customer impact

5G could sound like it's the answer to every connectivity problem, but it's past time to correct that misconception or adoption will likely remain slow. 5G is just one of the tools in the telecom toolbox.

To find new sources of revenue, instead of going for utility-style 5G scale, it may be better for telecoms to focus on identifying key points of attraction and customer needs for which telecom providers' specific capabilities and experience can make a noticeable difference to customer experience. The connectivity solutions and services needed will vary from situation to situation, so what telecoms end up recommending may or may not include 5G—for many use cases, slower speeds and narrower bandwidths, or even wired connections, may prove far more effective.

Equally, for most operators today, **according to the GSMA**, the B2C sector accounts for an average of 70% of telecom revenues. And yet B2B is their main driver of growth. This points to a way ahead: start thinking about 5G as table stakes to maintain competitive parity, not as a big bet to improve profitability.

The key for a telecom operator to unlock more of the revenue growth potential of B2B is to shift from seeing itself as a connectivity provider into being a connectivity partner—an equal that organisations can turn to when they need to solve connectivity problems or innovate around issues where connectivity could provide a solution, not just a utility.

To work out the areas in which to target their incremental investments, telecom companies will need to leverage expertise from multiple disciplines and data from

multiple sources to develop a robust and realistic planning algorithm. This process should involve stakeholders from product development, marketing and finance, as well as strategy and engineering, to help predict what's likely to be needed by different customer segments.

Doing so should help telecom operators join the dots between customer demand and network utilisation, competitor presence and product life cycles—all helping to identify the prime opportunities to deliver improved customer experiences. By including a strong focus on cost to serve—including likely ongoing network costs for high-demand applications, and the reputational cost of failing to deliver on the promise—telecom companies will also be able to have more informed discussions of pricing plans. This in turn could help point to ways to improve cost management through an increased focus on delivery via an ecosystem of vendors and partners, including by leveraging 5G O-RAN.

The result? Improved services and pricing means telecoms will start to be seen as more valuable by their customers—leading to closer, more lasting and more valuable relationships.

2. Go after the 5G private network opportunity—while it's still there

While companies are seeking areas to drive maximum impact, in the short-term the largest potential for 5G will be with business customers. **The GSMA reports** that, to date, only 13% of operators have launched enterprise 5G services beyond connectivity—but 64% plan to do so in 2023.

For business customers, the main driver of 5G-related equipment and services purchasing is currently the development of private networks. Currently only 12% of telecom operators offer private 5G solutions, **according to the GSMA**, but with a market size of US$483.5 million in 2022, analysis by PwC and Grand View Research has projected a compound annual growth rate of 54.3% to 2030.

In most cases, private networks won't really need 5G; instead, the key value-add that can transform telecoms from provider to partner is making the final link in the connectivity chain—linking the wider network up with an organisation's in-house systems. Making a move into private network delivery is likely to require significant investment or strategic partnering to deliver the necessary system integration expertise. The appropriate type of network needs to be defined and deployed, accounting for industry-, site-, device- and use-specific bandwidth, speed, security and latency requirements. The facilities themselves need to be effectively instrumented to connect multiple devices, sensors and instruments, with data flows integrated into appropriate models, apps and analytics systems to deliver value.

Many telecom firms currently struggle with this kind of system integration and deployment, and will need to invest in developing their capabilities if they are to effectively deliver. But they'll need to act fast, as this 5G business opportunity won't be around long.

If telecom companies don't use their legacy head start in the connectivity space to deliver this last-mile integration, someone else will. Many hyperscalers are arguably already de facto backhaul telecoms providers today, and are pursuing core and access networks-as-a-service. If this push continues, telecoms could lose out on a potential revenue stream where their capabilities could give them an opportunity.

3. Define how to play at the edge

To really deliver on their promise, most private networks—especially those containing extensive IOT devices—will likely have edge-computing components. This has long been an area where telecom firms have assumed they'll have a competitive advantage. Again, though, it's an opportunity that could swiftly be lost to hyperscalers if telecoms don't make the most of it.

Like 5G itself, edge computing will also likely follow the path of continuous incremental improvements that follow emerging use cases and demand, rather than a big bang. This kind of long game may not be for everyone—but if it delivers on its potential, it could unlock substantial new opportunities. PwC analysis suggests a compound annual growth rate of 23.3% to 2026, and **Gartner predicts** that by 2025 more than 50% of enterprise-managed data will be created and processed outside the data centre or cloud.

Much like the most engaging metaverse-like experiences of the next generation of the internet, initial demand for edge computing will likely be driven by stationary applications in homes, offices, factories and other business environments where local wi-fi will likely be sufficient. The first true 5G edge-computing use cases will likely be outfield settings with multiple moving assets, such as mines and ports. These settings will need high-fidelity mobile solutions as well as more bespoke and expensive web3 implementations that will be harder to scale. Because of this complexity, though, hyperscalers are less likely to pursue such specialist use cases. This presents telecom providers with a way

to build on their networking expertise to develop new capabilities that can serve as a showcase of their connectivity service delivery capabilities.

Ultimately, the rise of edge computing is likely to be the true enabler of the data-intensive and demanding killer apps that will drive 5G's mass adoption and new sources of value. Working with ecosystem partners to enable the development of these new products and services—focussing on the kinds of strategic control points that will also enable the next generation of the internet—could be a way for telecoms to capture some of that value while also demonstrating the true potential of 5G.

When it comes to demonstrating your value proposition, it's always better to show rather than tell. Successfully delivering complex edge-computing use cases will show the value of 5G—and, more importantly, telecom firms' ability to partner effectively to develop compelling connectivity solutions.

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