green paper

sixth generation

the importance of preventing 6G SAG

6g is coming

Whatever 6G becomes, one thing is certain: it cannot be yet another dismembered technology without a business case. Retrofitting a business case to 5G has proven disastrous, and not an exercise that should be repeated. 6G therefore has to be as much a business concept as a technology, and **the risk of 6G SAG**[1] must be understood and avoided.

Is 6G a technology or marketing concept?

Initially, 'generations' of technology had real meaning. The move from first generation analogue networks (only later were these badged '1G') to second generation (2G) digital networks was a major change – it was indeed 'generational'. But when the time came to upgrade networks once more, marketers jumped on this opportunity to promote the capabilities of third-generation (3G) networks. There was a lot to promote, as 3G promised to provide access to the transformational capabilities of the Internet from a mobile phone.

But 3G also marked the start of network hype and the first time we experienced significant lag between network delivery and adoption.
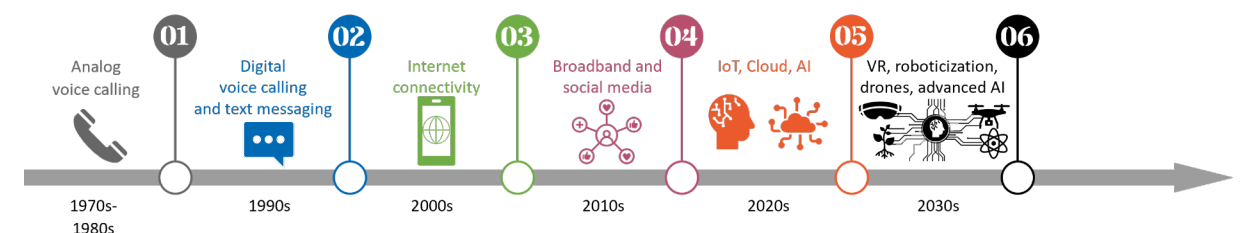
The effects of overhyping quickly became apparent when in many markets 3G did not take off as fast as bullish forecasters and telecoms marketers had expected. 3G was followed in due course by 4G, which substantially did live up to expectations, and subsequently by 5G (which didn't). By 5G, 'generations' of network technology had become as much a marketing concept and a source of technological pride – some would say hubris – as they have a meaningful technological jump. In the US, part of the 4G roadmap was even rebadged 5G simply for marketing purposes.

Agile networking

In reality, network technology is in continual development by network equipment providers (NEPs) and in a continual state of deployment by the world's operators. In an Agile world of continuous improvement, the 'generational' approach seems outdated and doesn't speak to the reality of complex, multi-generational and multi-technology networks. Rather than

Mobile innovation timeline

01	02	03	04	05	06
Analog voice calling	Digital voice calling and text messaging	Internet connectivity	Broadband and social media	IoT, Cloud, AI	VR, roboticization, drones, advanced AI
1970s-1980s	1990s	2000s	2010s	2020s	2030s

Source: Omnisperience 2023

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innovation being presented in large generational steps, 6G should therefore be viewed as a journey of many smaller steps that iteratively improve networks. As such, it becomes a technological era, rather than a static instance of technology.

Beyond the hype

Early speculation has begun as to what 6G will support. Some suggestions are almost as unrealistic as the EE 5G advert designed by Saatchi London, featuring actor Tom Ellis ('Lucifer'), who was shaved on the summit of Snowdon using a robotic arm operated by a London barber. "How many times has your network let you down when you need it most?" said Dan Treichel, executive creative director, Saatchi & Saatchi to The Drum. "That was the guiding light behind the idea and an experience that will resonate with everyone."[2]

Except it didn't use an entirely 5G network as initially claimed, because 5G wasn't available in that part of Wales and equipment had to be airlifted to the summit. Such a vainglorious demonstration not only undermined the point it was trying to make, but was also at odds with the industry's stated aims of becoming greener. It seemed as remote from customers' real needs as Snowdon is from major conurbations.

In this report we explore why 6G must avoid 'the insanity' of repeating the same mistakes and expecting different results[3] and be developed as a business-ready concept.

the hype, hope and reality of 6g

Despite 5G being more than "just another G" – at least according to Ericsson's advertising – the promise of 5G empowered robots shaving celebrities on mountain tops has failed to capture customers' imaginations. All of which was entirely predictable.

In 2016, William Webb wrote *The 5G Myth*[4], in which he pointed out that technological vision had become decoupled from reality. Webb stated the obvious – that MNOs have poor profitability relative to other sectors and face declining revenues with no clear indication how this will be reversed.

Such is the collective delusion, however, that Webb sounds like the small boy pointing out the Emperor is, in fact, naked[5]. He says it's not in the interests of any of the key players to cast doubt on a bullish 5G vision and that for some the emergence of 5G was essential for their very survival.

There is considerable pressure not to criticise the optimism and hype surrounding the next generation of mobile technology. Bain, for example, opined in 2018 that "Network operators that listen to the naysayers run the risk of missing out on the true benefits of this step-change technology."[6] While the authors set out a compelling case as to the benefits that can accrue from investing, what they miss is whether customers agree with them – the stark question of whether anyone is prepared to pay more for new services, or buy more, simply isn't addressed.

The result of the hype surrounding 5G is that it effectively died at MWC23. Christel Heydemann, boss of Orange, joined the growing chorus of voices suggesting the Emperor's new clothes might not be real. "Massive" network investments of EUR600 billion, she said, had proven "hard to monetise". Consumers, she added wryly, "expect to pay always less and get more." This meant 46% of telecoms CEOs now think their company won't survive another 10 years[7].

Ah, but 5G was never really a consumer technology, is the usual retort. But this presupposes that operators will invest solely on the basis of potential B2B revenues. It also assumes that businesses are mature enough to adopt automation, roboticization, virtual reality, AI (and all the other technologies that may require the bandwidth and low latency 5G or 6G networks provide) en masse.

Heydemann points to a more mundane prospect: that for most people 4G is currently more than adequate. Omnisperience concurs.

Most customers are currently preoccupied with costs, as a result of the polycrisis,[8] as well as whether connectivity is available and reliable, rather than with advanced concepts such as ultra-low latency, network slicing, or massive IoT.

Omdia's Dario Talmesio has summarised this situation by saying that 5G "has disappointed pretty much everybody".[9]

Let's remind ourselves where we are though. The GSMA forecasts that by 2026, 30% of mobile connections will be via 5G and that 5G connections will not overtake 4G connections until 2029.[10] Significantly, this will be the point at which we expect to be rolling out 6G.

Given their reluctance to invest more without a clear business case, these forecasts indicate that many operators are taking a wait-and-see approach.

Participants at a recent 6G Symposium run by 6G World[11], discussed 6G business cases and customer need at length. Omnisperience's view, however, is that it is pointless to speculate whether people will really want (and pay for) holographic communication and tactile internet in the 2030s. Doing so risks overhyping technology once again, continuing to diverge from real customer need, and failing to pinpoint what will drive profitability.
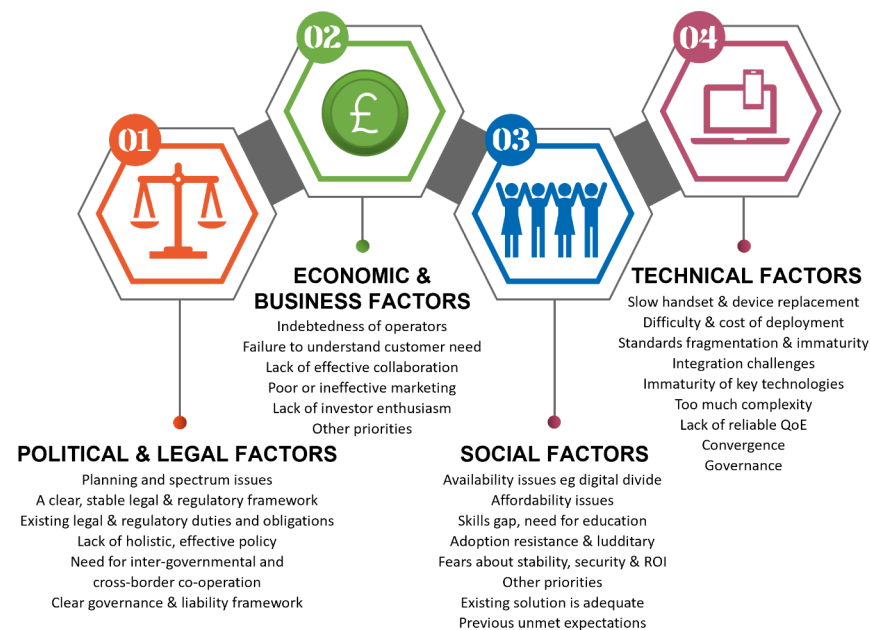
This will inevitably result in a significant **service adoption gap** (SAG). 6G SAG is dangerous to individual network operators, which will be left financing it, but also to governments and investors. To avoid it, all stakeholders must understand the likely causes and consider how to address them.

While it's critical to put as much effort into 6G business case development as the technology, it's still too early to talk about likely uses, pricing and packaging. Instead, we should be concentrating on delivering a robust, smart and adaptable network that's easy to consume, innovate upon and incorporate into future connected services.

Omnisperience does not seek to infer that there is no business case for 6G. In many ways, 6G will deliver what was promised from 5G. Instead, we argue that making a realistic business case for 6G requires the shedding of a pervasive 2G mindset.

SERVICE ADOPTION GAP

Potential causes of 6G SAG

Source: Omnisperience 2023

POLITICAL & LEGAL FACTORS
Planning and spectrum issues
A clear, stable legal & regulatory framework
Existing legal & regulatory duties and obligations
Lack of holistic, effective policy
Need for inter-governmental and
cross-border co-operation
Clear governance & liability framework

ECONOMIC & BUSINESS FACTORS
Indebtedness of operators
Failure to understand customer need
Lack of effective collaboration
Poor or ineffective marketing
Lack of investor enthusiasm
Other priorities

SOCIAL FACTORS
Availability issues eg digital divide
Affordability issues
Skills gap, need for education
Adoption resistance & ludditary
Fears about stability, security & ROI
Other priorities
Existing solution is adequate
Previous unmet expectations

TECHNICAL FACTORS
Slow handset & device replacement
Difficulty & cost of deployment
Standards fragmentation & immaturity
Integration challenges
Immaturity of key technologies
Too much complexity
Lack of reliable QoE
Convergence
Governance

A **service adoption gap** (SAG) occurs when there is a delay between services becoming available and customers buying them.

Disconnect with the customer. SAG is symptomatic of an internal focus rather than on how a company adds value to the customer. Customers do not like price rises that are not accompanied by a perceived increase in value.

Opportunity costs are high, because potential revenue is permanently lost during the SAG.

Firstly, we need to admit that speed and latency have largely failed to grip the imagination of everyone outside the network engineering community. Customers don't buy network technology *per se*. What they buy is a solution to their problems enabled by networks. Their lived experience is formed not by theoretical network performance, but by a complex mix of applications, software and hardware combined with context, policies, processes and so on, and is dependent on the totality of what they and others are doing.

Secondly, we have to move beyond thinking in terms of customer segments and believing we are able to determine what these want. In the 6G era, customers will require a hyper-personalised network experience and they will define what this is for themselves. They will also change their minds and requirements continually, and expect networks to adapt.

While AI will help networks anticipate and align to needs in a more agile fashion, our thinking must also adapt to be truly customer-centric. We must accept the customer will be in control – not us – and able to precisely define and adapt what they want through self-service. That is a *good thing* from a business perspective.

In a recent telecoms.com podcast, Rajesh Pankaj, CTO of InterDigital, put this very succinctly. The transmission of data is the industry's concern, he said, but how that data is used is somebody else's problem and opportunity.

While this suggests a greater separation of network operation from service provision, we believe this should be viewed as a kind of liberation not a loss. It frees operators to do what they're great at – building smart, capable, robust networks, while being tightly focused on how they add and derive value from that. This will see them become far more discerning about which end users they supply, as well as which opportunities and sectors they pursue.

Notes

1. See page 5; 2. See https://www.thedrum.com/creative-works/project/saatchi-saatchi-close-shave; 3. Although widely attributed to Einstein this quote originally appeared in the 1983 novel 'Sudden Death' by Rita Mae Brown 4. www.amazon.co.uk/5G-Myth-vision-decoupled-reality/dp/1540465810; 5. The Emperor's New Clothes by Hans Christian Andersen; 6. Download report: https://www.bain.com/contentassets/ 8d0756628a3042f0b8c18b8c5f27d748/bain_brief_why_the_5g_pessimists_are_wrong.pdf; 7. Hear Heydemann's speech here (from 35.20 onwards) https://www.mwcbarcelona.com/agenda/session/keynote-1-vision-of-an-open-future; 8. https://www.weforum.org/agenda/2023/01/polycrisis-global-risks-report-cost-of-living/; 9. https://www.msn.com/en-xl/news/other/how-5g-disappointed-pretty-much-everybody/ar-AA1856ZO; 10. Download report: https://www.gsma.com/mobileeconomy/wp-content/uploads/ 2023/03/270223-The-Mobile-Economy-2023.pdf; 11. www.6gworld.com/

making the 6g business case

It's not technological innovation that's the major issue or risk for 6G. A far greater problem is making the business case. Heavily indebted by decades of network investment and rounds of M&A, operators are exhausted by hype and will need far more incentive to invest than optimistic forecasts and numbers plucked out of the ether by vendors and analysts. That said, it's clear 6G needs to deliver certain key things that operators will require in the 2030s. Here's a few of them.

Energy efficiency

Telefónica has proudly noted that it reduced energy consumption by 7.2% between 2015 and 2022. This despite a sevenfold increase in traffic. With energy accounting for 10% or more of running costs, any reduction in energy consumption impacts both the bottom line and pricing; but energy efficiency is also important to meet government targets and align with customer expectations and carbon goals.

6G will be more energy efficient than 5G, but will also offer new methods of reducing energy consumption even further – turning off parts of the network not in use and powering them up in a just-in-time manner using AI-driven predictive analytics, for example. Importantly, energy efficiency also needs to embrace edge computing and data storage.

True network convergence

6G will combine all mobile assets in a single network-of-networks but move beyond that to incorporate fibre, WiFi and satellite capacity – delivering true convergence. AI will play a critical role in squeezing maximum value out of both new and legacy assets to deliver intelligent choices for customers around quality of service, cost, security and so on.

AI will also assess where best to build in a customer- and business-centric fashion to extend coverage or densify networks – including which type of capacity to deploy – in a smarter, just-in-time manner.

Network trust

Two aspects of trust need to see a step-change with 6G. The first is ensuring connections are available, perform as needed and are reliable – i.e. that they can be trusted to deliver. The second is that all the layers supporting a service, as well as the service itself, must be **secure by design**. Effective and proactive cybersecurity combined with robust digital identity and ID verification have to be incorporated into the 6G concept from the start, along with secure network operation.

Customer centricity

Operators must join up their own internal departmental silos to take a more integrated approach to the business of connectivity. This business integration includes better collaboration between networking teams (mobile, broadband, WiFi etc), combined with the expertise of business teams (finance, sales & marketing, products, customer experience & support) to create a smarter offer. But, ultimately, the most important thing about 6G is it will be truly customer centric, with new value being created from delivering hyper-personalised, secure and reliable services.
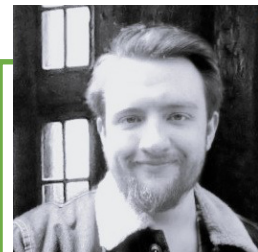
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Located in the heart of the UK, **Omnisperience's** experienced analysts focus on improving the commercial success of digital service providers. We take a fresh approach to research and advisory projects, helping our clients better understand their market and customers and, as a result, become more profitable.

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