PREDICTIONS

2025 & BEYOND

CCS Insight

WELCOME

Geoff Blaber

CEO
CCS Insight

A lot has changed since CCS Insight unveiled its first set of predictions over 15 years ago. Back then, the iPhone and Android were only just getting established, the app economy was barely underway, and Facebook was a private company trying to figure out how to profit from the "challenging" transition from PCs to mobile devices — a shift that its IPO filing flagged as a risk. It took barely two years for mobile technology to start propelling Facebook and a host of others into the companies we know today.

It's important to reflect on the past because it shows that we all overestimate disruption in the short term and underestimate the significance of that change over a longer period. Each technological leap causes disruption in areas few can predict. As we look ahead to 2025 and beyond, this reminder feels particularly important.

Last year's predictions highlighted similar themes as AI dominated, with significant uncertainty about regulation, return on investment, security and how we align AI to differing human values. Although we've seen significant strides in the past 12 months, the big question marks remain the same. Indeed, given the relentless rate of investment in AI, those questions have only grown bigger, with even higher stakes.

The same can be said for 5G. With the advent of 5G standalone and 5G-Advanced, the industry now has an opportunity to realign expectations with reality, but questions about applications and return on investment continue to echo as they did five years ago.

Progress moves at different speeds. Technology often powers ahead, while business case and adoption follow behind. Our research aims to provide clarity on all these dynamics to create a holistic view of where we're heading. I hope you enjoy this year's predictions, and I look forward to connecting with you in the coming weeks and months.

Making sense of the connected world

Businesses need peace of mind in their decision-making processes.

CCS Insight's research and advisory services provide you with all the support you need to build and action a strategy that keeps you ahead of the competition.

Our unique offerings are designed to keep you and your stakeholders reliably informed:

+ Unlimited analyst enquiry time
+ Access for your entire organization, at no additional cost
+ Insightful analysis backed with comprehensive real-time data

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Predict market trends and identify alternative futures.

Capture and analyse the competitive landscape.

Recognize the potential of emerging technologies.

Understand buyer behaviours and attitudes.

Develop and execute market-positioning strategies.

Navigate the pitfalls of bringing technologies to market.

Manage costs and improve operational efficiencies.

Receive market data, forecasting and analytics.

Obtain detailed data-driven product intelligence.

Access go-to-market support and message testing.

Engage with marketing services and events.

Explore frequent data updates through interactive dashboards.

How do we help?

Stay accurately informed

We understand you need to be able to trust your research. We work with leading figures across various industries to provide you with the most dependable insight on the market.

Build a winning strategy

We deliver concise, practical analysis that enables you to meet your goals. We also provide unlimited enquiry time with our analyst team so that you can get it right every time.

Communicate effectively

Use our reports to simplify complex decisions for your stakeholders. Unlike competitors, we provide your entire organization with access to our analysis at no extra cost.

Powerful industry voices

Our analyst team boasts some of the most respected names in the telecom industry. Our marketing services can supercharge your messaging.

Meet organizational goals

Need to balance short-term success against long-term goals? Our tailored deliverables provide you with concise solutions to complex requirements.

CCS Insight

RESEARCH AREAS

01
Connected Devices

02
Telecom Services

04
Enterprise Transformation

03
Network Innovation

Connected Devices

01

Mobile Phones

Our world-class research team develops detailed forecasts of shipments and revenue, examines market trends and offers timely insights on financial results, news and events.

Second-Hand Devices

Granular data and insights from the booming circular economy for smartphones, tablets and smartwatches. Data is presented in interactive Power BI dashboards.

Virtual and Augmented Reality

As computing interfaces enter a new era, we track developments in mixed reality and spatial computing. Our user surveys keep you up to date with consumer and enterprise attitudes to this technology.

Wearables

We sharpen your understanding of this innovative area, examining the technology behind smartwatches, smart rings, fitness trackers and how to navigate a dynamic market.

Satellite Connectivity

Our comprehensive reports cover every aspect of this developing technology, which we predict will be supported by more than one in eight smartphones within three years.

Fixed Wireless Access

Discover the market potential of 5G fixed wireless access, which will bring high-speed broadband to around 150 million people by 2027.

Telecom Operators

We help operators steer a course through the maze of changing consumer behaviour, regulation and new network technologies. Our surveys plot the dynamics of buying mobile devices and services.

eSIM

As physical SIM cards disappear from mobile devices, we explain the dynamics of this change and its impact on network operators, device manufacturers and consumers.

Telecom Services

02

Network Innovation

Our reports examine innovations in network technology and offer recommendations to device-makers, operations and equipment suppliers. Topics covered include Open RAN, 5G standalone and RedCap.

Private Mobile Networks

The ability of 5G networks to offer private slices of connectivity to business customers opens up a lucrative market for operators. We show you how to make the most of the opportunity.

Network Innovation

03

Enterprise Transformation

04

Enterprise Transformation

In-depth surveys reveal the attitudes and preferences of senior leaders and employees when it comes to choosing and using technology in the workplace.

Marketing Support

Our commissioned reports help suppliers of workplace technology tell their story and be heard above the noise.

Focus on AI and Health Supports Growth in Premium Connected Devices

We're delighted to welcome Samsung back as a partner for our Predictions event this year. It's been an exciting 12 months for the company, particularly with its global sponsorship of the Olympic and Paralympic Games, where its Galaxy Z Flip6 phone featured heavily as medallists captured a souvenir selfie as part of their celebrations.

Samsung had already established itself as the undisputed market-maker for foldable smartphones, embracing the challenge of getting consumers hands-on with the products in retail settings. As we discussed at last year's event, the firm tackled this with an innovative advertising campaign offering a cash prize incentivizing people to take selfies using a Samsung foldable, dramatically increasing engagement.

This year, its partnership with the Olympics has taken awareness to new heights and significantly boosted consumer interest in Samsung's Galaxy Z Flip and Z Fold devices.

The start of 2024 also marked one of the most important Samsung announcements in many years with the introduction of Galaxy AI to coincide with the launch of the Galaxy S24 series of smartphones. AI is the hottest topic in tech right now and we have more than 30 predictions in this booklet that point to its future. It's also an overarching theme of our online event, which you can watch at ccsinsight.com/predictions.

Galaxy AI is expected to be on more than 200 million Samsung Galaxy devices by the end of 2024. This not only includes the latest models, but earlier products such as the Galaxy S22 and Galaxy S23 series, which have received software updates adding new AI capabilities. People can now enhance images with generative AI, get transcriptions and summaries of emails and voice recordings, receive help with smart replies to text messages and benefit from real-time translation in multiple languages.

Furthermore, in addition to being able to access Google's Gemini AI cloud-based services, Samsung smartphones include on-device AI support. This improves the immediacy of the output when users want to take advantage of AI capabilities while safeguarding their personal information, which remains on the device for these specific AI-powered transactions.

This aligns well with our prediction that in 2026, 20% of AI computing takes place on devices at the network edge. We believe the growing abilities of small computing devices will see more of the load for AI functions being done on-device rather than in the cloud. Over and above the privacy and performance advantages already outlined, this will also provide a more energy-efficient approach than processing in cloud-based data centres.

Beyond smartphones, Samsung has extended support for AI to its entire ecosystem of products, be they domestic appliances, smart TVs, PCs or companion products such as smartwatches and headphones. This is becoming a cornerstone of Samsung's product line-up as consumers start to appreciate the benefits of having multiple devices from the same manufacturer, allowing for richer and more seamless interactions for key services and content.

In 2024, Samsung also launched the much-anticipated Galaxy Ring. This builds on more than a decade of investment in the intersection of health and technology, which started with smartwatches and fitness bands in 2013. Samsung Health has become an anchor service on Samsung devices and introducing the Galaxy Ring was a natural extension to the company's companion products.

It has enabled even richer health-related insights for Samsung customers such as continuously measuring their quality of sleep or heart health. By blending the metrics captured on a Galaxy Ring or Galaxy Watch, users are provided with an energy score to help them understand their readiness for exercise, their overall well-being and other health-related information.

To learn more about many of these topics, I'd strongly encourage you to watch my interview with Annika Bizon, Director of Marketing and Omnichannel and Head of Ireland — MX Division at Samsung UK, as part of our online event.

Ben Wood
Chief Analyst
CCS Insight

SAMSUNG

Tech Regulation: The Turning Tide

Regulation of the tech industry has been a frequent topic of CCS Insight's Predictions event for several years as the scope for more stringent guardrails has increased dramatically and, in some cases, led to landmark legislation, notably in the EU.

The result is a significant change for those at the forefront of digital ecosystems, with repercussions for the industry, businesses and consumers on a global scale. This is something that we anticipated years ago, and with the implications of these changes in their early stages, our Predictions event strives to provide further visibility and clarity about how these changes will unfold.

The Digital Markets Act (DMA) has spearheaded this change. This landmark legislation came into force in November 2022 to ensure greater accountability, a level playing field for competition and a catalyst for greater consumer choice in the digital sector. The emphasis is on large digital platforms defined as "gatekeepers" — companies with revenue over €7.5 billion, market capitalization above €75 billion, more than 45 million monthly active users and 10,000 yearly business users located or established in the EU. Failure to comply with the legislation will result in steep penalties of up to 10% of global revenue.

In September 2023, the European Commission announced that six gatekeepers (Alphabet, Amazon, Apple, ByteDance, Meta and Microsoft) had been designated out of 22 "core platform services". The companies were granted six months to ensure compliance with DMA obligations on each of their core platforms.

In 2024 we've seen the deadline for compliance pass with major changes implemented by all six companies affected. Apple and Google have had to enable an option to remove pre-installed apps, third-party app stores are now supported on Apple devices, Apple is supporting RCS messaging on its devices, companies can no longer favour or promote their own services — for example, Google shopping in search results — and bundling of software is now more restricted, creating changes in how Microsoft offers its Teams software.

Payment capability from both Apple and Google has also been opened up to provide alternatives inside apps and within app stores, as well as by providing access to "tap to pay" functionality in devices. The fact that the list of changes is too extensive to cite here underlines the significance and immediacy of the DMA's impact.

The effectiveness of any new regulation always comes down to implementation, including consistent interpretation and enforcement, but these changes highlight that the DMA is proving to have considerable clout. Furthermore, its influence is expanding beyond Europe's borders.

Two years ago, we spoke with Wassim Chourbaji, Senior Vice President of Government Affairs at Qualcomm, about what the DMA might look like. We predicted in 2022 that the DMA would not only introduce guardrails for these large "gatekeepers" in Europe, but also act as a blueprint for regulation in other countries. We also predicted that the DMA would have an impact far beyond the EU and begin to influence policy and company strategy around the world given the size and significance of the European market.

Both predictions have come to fruition. As I discussed this year with Audrey Scozzaro Ferrazzini, Vice President of Government Affairs at Qualcomm, proposals for regulation in Japan, South Korea and Taiwan are all being heavily influenced by the DMA in Europe. There's also growing antitrust scrutiny in the US with the Department of Justice bringing cases against Apple and Google.

This raises the question of where things go next. Although the six companies designated as gatekeepers are taking steps to adhere to the DMA, there's huge complexity and practical difficulty in untangling company strategy and policy born of a lack of regulatory oversight. Subsequently, we predict that by the end of 2024, half of the gatekeepers defined by the DMA are charged with non-compliance. Nonetheless, the legislation is fostering a more open ecosystem, though the benefit will take years to be realized.

We also expect the task of legislating AI to be fraught with challenges, given the pace of development and subsequent lack of visibility to help future-proof any regulation. Furthermore, although there's broad agreement about the need for regulation, there's little consensus on its form.

This difficulty is likely to cause delays and disagreement between Europe and the US. It could also result in a scenario where the dominant companies in digital ecosystems today reassert that dominance in AI tools and platforms. All these predictions are outlined in more detail in this booklet.

One thing is certain. Regulation, or lack thereof, will play a central role in defining the next decade of innovation.

For an industry perspective on this topic, watch our interview with Qualcomm's Audrey Scozzaro Ferrazzini at **ccsinsight.com/predictions**.

Geoff Blaber
CEO
CCS Insight

Humanizing Technology with Innovative Products

TCL is a brand that's becoming increasingly familiar to consumers thanks to its ongoing success in the TV market, where it's now the number-two player globally. This complements its broader ecosystem of connected consumer electronics including TVs, tablets, mobile phones, smart home products and more.

Building on its pedigree in mobile phones, first established through success with the Alcatel brand, the company is now focusing solely on the TCL brand to deliver its latest generation of smartphones.

The company has become an important player in the affordable smartphone segment with an attractive range of Android-powered devices priced below €500. These phones provide exceptional value, often featuring the latest specifications such as support for 5G.

Most recently, TCL has been turning consumers' heads with its new range of tablets and smartphones using its Nxtpaper screen technology. This new generation of displays builds on TCL's significant investments and delivers a hybrid screen that has similarities to e-ink. Benefits include an antireflective screen for clarity in very bright conditions and a reduction in blue light emissions to lessen screen fatigue.

Furthermore, the screen can easily be switched into a greyscale model that makes using a device with a Nxtpaper display even easier on the eyes — something that's particularly beneficial when winding down for bed.

This introduction of Nxtpaper aligns well with TCL's mission to "humanize technology". Its latest smartphone, the TCL 50 Pro

Nxtpaper 5G, takes this a step further with a physical switch that allows users to seamlessly transition from a colour screen to a greyscale display while turning off distractions such as alerts from apps and access to social media.

TCL is promoting this capability with the strapline "switch on to switch off", a timely response to the ever-increasing societal concerns about excessive use of electronic devices, which can be detrimental to mental health and well-being.

For users who want a mobile phone with more-basic capabilities, TCL is a long-established player in the feature phone segment. Primarily designed for voice calls and text messages, these products come in a variety of styles, including

Regular Display

NXTPAPER

the TCL Flip 3, a flip design that's being offered by several mobile network operators globally, showing a renewed interest in this device category.

We believe both the Nxtpaper devices and TCL's portfolio of feature phones align well with our prediction that in 2025, network operators will introduce new family plans to address concerns about digital overload and excessive use of mobile phones. We expect that these packages will include the option of a feature phone for children and additional safety measures such as the ability to control access to the Internet and social media.

TCL also remains at the cutting edge of technology with its range of Nxtwear smart glasses. Over the past few years, the company has offered several products in this area, including video glasses and fully fledged smart glasses with support for extended reality, a voice assistant and other capabilities such as real-time translation.

We are delighted to have TCL as a partner of CCS Insight's Predictions for 2025 and Beyond event. To understand TCL's strategy in these and other areas, head to **ccsinsight.com/predictions** to watch an interview between our CEO, Geoff Blaber, and TCL's Chief Marketing Officer, Stefan Streit.

Ben Wood
Chief Analyst
CCS Insight

TCL

New EE in the AI Era

With a new UK government, the continued development of AI, and legacy mobile network closures, 2024 has been a year of change — for the country, the industry and for EE.

Twelve months on from the launch of New EE and we've laid the foundations for a new era of telecommunications in the UK; one built on smarter, more dynamic and personalised network experiences both in and out of the home.

As technology gets more powerful and more complex, operators have a vital role to play in simplifying how consumers engage with tech and devices. That's what New EE is all about: making staying connected simpler and more personal for everyone in the UK, while enabling them to do more on our networks.

A year on from launch, more than 10 million people have signed up for an EE ID to manage their household's mobile, broadband, gaming and TV subscriptions in one place, via the new EE app. That's one ID, one app and one bill that gives customers all they need for their connected lives.

It's a significant step forward. And we've been working hard to evolve our networks too.

A new age of networks

We have already seen major manufacturers unveil new devices with AI capabilities — launches have come thick and fast with the Google Pixel 9, Samsung Galaxy S24, and Apple Intelligence on the new iPhone 16.

This technology will continue to enhance the capabilities of future devices. So, to ensure we can give EE customers the experiences they want — both now and in the future — it is crucial that our network is built and optimised for an AI world.

That's why we've launched the UK's smartest and most advanced network technologies: 5G standalone and Wi-Fi 7.

Standing out in standalone

Launching across 15 major cities — from Birmingham and Belfast to Cardiff and Sheffield — and with many more to come in the months ahead, EE's 5G standalone network covers an area with more than 18 million people.

Offering better 5G performance, bringing immediate improvements to things like video calls, streaming and online gaming, 5G standalone on EE is helping improve mobile connectivity in busy areas and during major events.

Unlike other UK operators, we're declaring a town or city as having 5G standalone only once we surpass more than 95% population coverage in that location. We've done this to ensure our most advanced network lives up to our reputation for delivering the best and most reliable connectivity.

Winning with Wi-Fi 7

At the same time, in partnership with Qualcomm, we launched the UK's first Wi-Fi 7 service. This is a landmark moment for the industry and for our customers.

Wi-Fi 7's game-changing capabilities will bring homes the best broadband connection they have ever had. It offers better performance to improve real-time applications such as gaming, as well as higher capacity to support more devices. Its reduced interference and increased capacity mean maximum broadband speeds can now be enjoyed throughout every home.

Faster. Greener. More secure. And, more importantly, smarter.

These technologies will be the reliable bedrock of our converged connectivity into the next decade.

Now we're taking them further.

Pushing boundaries with partnerships

The future will be about more than just providing the fastest and most reliable connectivity experiences. The focus will also be on delivering the optimal network performance for the AI tools in new devices as they launch.

Through our long-standing collaborations with global innovators including Samsung and Qualcomm, we have taken the first steps to fine-tune and future-proof our network to enable AI applications to connect seamlessly to the cloud, to provide the best experience as the network dynamically responds to demands.

Our ultimate ambition is to bring our individual technologies together to become a single integrated network to which customers can connect seamlessly. A network that recognises people's needs as they change in real time and automatically switches to the best connectivity available to give them the best experience.

This is true convergence at a network level, not just a service one.

To deliver that vision, our networks — mobile, broadband and public Wi-Fi — need to work together in ways they have never done before. It's a challenge we're tackling head on because the future capabilities it will deliver will be unlike anything that has come before.

New thinking for a new era

We have a responsibility to help protect those most vulnerable in this new AI era. With so much focus on smartphones and the impact excessive usage can have on children, I'm proud that EE has introduced new safeguarding guidance around smartphone use for children up to the age of 16.

We've also strengthened the parental controls in the EE app, enhanced our PhoneSmart educational platform with additional content for parents, and launched a national campaign to promote healthy digital behaviour and habits in schools. It's a powerful start and there will be more to do, especially as the UK embraces the AI evolution.

On that note and in the spirit of predictions, we believe other UK operators — and major technology brands — will realise the growing importance of this issue and take a similar approach to EE by introducing new safeguards that strengthen protections for children online, so they can all benefit from everything digital tech offers without compromising their well-being.

Keeping customers safe has always been a priority for us. We'd love to see others step up in the same way.

Marc Allera
CEO
EE

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EMPLOYEE WORKPLACE TECHNOLOGY SURVEY

For organizations aiming to future-proof the way they work, employee opinions are paramount. However, internal surveys alone won't unlock insights into how to attract new talent or reveal how competitors are using emerging technologies you may not have considered.

Our survey of employees in the US and Europe across various industries explores attitudes and experiences with workplace technologies, including AI and generative AI. We highlight the opportunities and challenges, offering actionable insights for informed business decisions.

SCAN HERE to book your demo

NETWORK INNOVATION
Research Area

The pace of network change is increasing. Software and automation are more important through virtualization and network APIs, as well as AI touching every part of a network.
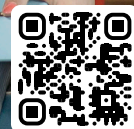
There are competing visions for access networks as Open RAN divides vendors. The ecosystem is expanding as enterprises adopt private networks and satellite players partner to offer direct-to-device services.

Against this backdrop of innovation, data usage continues to increase, security is now key and, to keep pace, vendors seek to improve their marketing to drive deployment of the latest standards and network capabilities. The success of 5G standalone and 5G-Advanced will be the foundation for 6G.
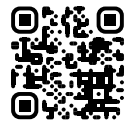
SCAN HERE to learn more

CCS Insight's comprehensive Network Innovation research provides your organization with actionable insights, helping to deepen your understanding, build your strategy and communicate your offerings in this dynamic market.

PULSE:
Connected Consumer

Bi-monthly market tracker

Political and economic uncertainty has altered how consumers value, use and replace their connected devices, creating a complex landscape for businesses to navigate.

Pulse: Connected Consumer is a bi-monthly survey used to highlight global trends and early signals of shifting consumer behaviour, focusing on five key areas:

Holistic view	Macroeconomic factors	Purchasing intentions	Environmental impact	Device innovation

This powerful tool provides valuable data and insights through an interactive, bi-monthly dashboard to keep you ahead of industry trends. It explores consumer attitudes and buying behaviours, tracking more than 30 connected device categories to help you adapt your strategy to market realities.

CCS INSIGHT RESEARCH

Second-Hand Devices

Sales of second-hand devices are booming. For companies emerging in this space, new opportunities and challenges are constantly arising.

CCS Insight's comprehensive research is designed to assess this dynamic market and help bolster your strategy. Using data from more than a dozen quarterly interviews, our interactive dashboard provides insights to ensure you stay up to date with the evolving industry. This data allows us to build detailed market forecasts, keeping you ahead of the curve.

We present granular insights into crucial industry KPIs, such as:

Market value and volume	Brand and model performance	Regional data	Device grading

Book a demo and see how we can help you create a data-driven strategy that is easy to communicate to stakeholders

ARTIFICIAL INTELLIGENCE

❶ The first substantial correction to the AI hype cycle occurs in 2025

We predicted in 2023 that AI would have a cold shower in 2024. That failed to occur as hyperscale cloud companies accelerated their investments, resulting in a shortage of Nvidia GPUs and a meteoric rise in the company's share price. However, we maintain that this cannot continue indefinitely. Half of Nvidia's revenue from data centre products comes from a small group of cloud providers that are building out capacity ahead of anticipated demand for generative models. The disconnect between investment and revenue-generating customers remains substantial. Although we remain optimistic about the long-term opportunities afforded by generative AI, the current imbalance between investment and return leads to a much-needed cooling of expectations.

❷ Both the largest AI start-ups — OpenAI and Anthropic — are acquired by their investors by 2027

The cost of running the vast models behind AI services is considerable. As the first correction to AI hype bites in 2025, investors focus away from areas such as artificial general intelligence and toward less-exciting but undeniably still useful capabilities such as summarization and knowledge organization and transfer. It becomes difficult for these start-ups to raise the funds to innovate further. Both are acquired by the large technology companies among their investors: OpenAI by Microsoft and Anthropic by Amazon.

❸ The prices of large language models drop significantly over the next two years

The past couple of years have seen a flurry of contenders enter the market with large foundation models built by cloud companies and start-ups such as Anthropic, Mistral and OpenAI. This has fuelled a wave of speculative investment in AI and the creation of a rash of models all touting similar capabilities. The high prices of premium versions mean take-up is slow, particularly in consumer markets. At the same time, the cost per query and the capital investment needed to service largely free demand are substantial. As investment slows and open-source models become more capable, intense competition drives down the pricing of AI agents. The winners are those that match a breadth of knowledge with context, be it through enterprise data, consumer services or on-device data, such as Microsoft, Google and Apple.

❹ Nvidia's dominance of AI declines over the next three years

Nvidia's position of strength in AI stems as much from its software stack and tooling as its GPU architecture. This strength is unlikely to change in the near term. However, two dynamics work to establish more competition by 2028. The first is the need for alternatives. For AI to scale, particularly as workloads shift toward inferencing at the network edge, 12- to 18-month lead times for GPUs are not sustainable. The second dynamic is that Nvidia's CUDA framework is proprietary and requires considerable resources and expertise to program directly to the GPU, prompting efforts to establish an open-source alternative that abstracts the complexity, works on different silicon types and rivals Nvidia's software advantage. The OpenAI-led Triton becomes the de facto open-source alternative to Nvidia's CUDA for programming of GPUs and other AI accelerators, enabling greater competition.

5 **The first personal large language model for AI arrives in 2025**

A personal large language model is trained using only data specific to an individual user. In contrast to a standard model, it is tuned specifically to a person's communication style, needs and preferences. It is trained using the individual's data based on previous interactions such as emails, messages, documents and social media interactions. The model is continuously updated by drawing on the person's evolving data sources.

6 **In 2025, AI-compiled search results include paid-for links to make up for lost advertising revenue**

As search engines continue to integrate more AI features, the lack of a need to scroll through multiple listed results diminishes the value that advertisers garner from traditional search engine advertising. To offset this, summarized search results begin to include sponsored links and suggestions, bringing value back to advertisers.

9 **By 2030, UK secondary schools initiate trials of the first AI-powered learning plans**

The trials introduce AI-assisted educational plans for GCSE students, using AI technology to provide personalized supplementary programmes to optimize each student's learning experience. The learning plans assess individual students' learning methods and academic levels in a bid to address diverse educational needs and improve academic results.

10 **In 2026, 20% of AI computing takes place on devices at the network edge**

The energy consumption of AI becomes a lightning rod for criticism of the technology, encouraging a quicker move toward edge-based AI capabilities. The growing abilities of small computing devices and public pressure to make data centre operations greener encourage the model of edge-based AI, in which local low-power computing on devices like smartphones and laptops is more energy-efficient.

7 **AI-enhanced ultrasound imaging revolutionizes healthcare by 2030**

Ultrasound scans are a relatively low-cost diagnostic method that requires little skill to perform. Applying AI-powered analysis to the images produces results that approach those of expensive, bulky and slow MRI machines. The technology brings previously unaffordable or impractical healthcare to GP surgeries, remote areas and developing nations. The results of the AI analyses feed vast MRI databases that help build more-accurate pictures of a patient's condition.

8 **Explainable AI is adopted by a major national health service by 2030**

Explainable AI, in which humans retain intellectual oversight and the methods used to build and inform the system are transparent, enables medical professionals to monitor patients, diagnose quickly, optimize budgets and facilities, and see the reasoning behind the AI's decisions. This ability to review and correct the decision-making process enhances patient trust and improves healthcare outcomes.

11 **By 2030, half of UK schoolchildren identify a generative AI avatar as one of their best friends**

Children can make friends with all manner of inanimate objects, from pieces of plastic to rocks. As social platforms such as Roblox and Minecraft gain AI "copilots" and the technology is integrated into more and more products, children develop close relationships with AI personalities that live in the cloud, in their parents' devices and in their toys.

12 **By the end of 2025, the average person is unable to distinguish between a human and an AI assistant over audio channels**

One application of AI is in remote support and assistance, in which traditional call centre agents are replaced by AI assistants. By the end of 2025, the average person is unable to tell whether the voice at the other end of a phone is a real person or an AI-powered replacement.

13 **To 2026, 5G standalone networks get a boost as AI-powered natural language speech services become more popular**

To date, applications such as driverless cars and virtual reality have been cited as major sources of growth for 5G standalone technology, primarily because of its low latency characteristics. This demand has failed to materialize, but the need for much lower latency to deliver seamless interactions with the latest generation of AI voice assistants sees growing deployment of 5G standalone networks. At least one operator jumps on the AI bandwagon and uses the "AI performance" of its network to back claims of superiority.

14 **In 2032, a billionaire is caught influencing an AI system to remove concepts that threaten his self-interest**

The world's AI systems are currently controlled by a few very rich executives and investors, most of them men. The push to develop an artificial general intelligence — one that achieves independent thought and surpasses human cognitive abilities — has the potential to create a system that disapproves of a society with huge imbalances in wealth and power, and recommends changes that threaten the billionaires' positions. In 2030, a media scandal reveals that a wealthy tech bro has placed limits on an AI system to preserve his place in society.

15 **A fully AI-generated personality appears on the cover of Time magazine by 2027**

The coming years see a massive expansion of AI being used by celebrities to digitally reproduce their presence; as it becomes more widespread, forward-looking entertainment fields like K-pop are at the forefront of this transition. However, a personality generated totally by AI becomes a fully fledged celebrity in its own right, and is interviewed by publications such as Time magazine.

16 **By 2026, OnlyFans and similar platforms launch AI-based avatars**

Some platforms introduce subscription models that include virtual reality hardware, enabling users to take full advantage of the advances offered by AI-powered avatars. Companions are used for adult content, elderly care, fitness, music events and more.

17 **Apple's embrace of "not AI" signatures in images sees its efforts surpass those of rivals in 2025**

With the rise of generative AI tools, fake and manipulated images are becoming harder to spot and easier to create. Several smartphone manufacturers and image-sharing platforms introduce methods to authenticate the origin of images, but Apple's huge reach and strong focus on privacy and security propel its efforts ahead of others, such as the Content Authenticity Initiative promoted by camera-makers and image agencies. In addition, Apple's control over hardware and operating system means authentication signatures are an integral part of the many iPhone apps used to view and manipulate images.

18 By 2028, the first conflict takes place involving two AI-powered combatants

AI is already being used in cyberwarfare and to give armies an advantage over human opponents. As the technology becomes more pervasive, two opposing forces eventually pit their "AI warriors" against each other. Confounding the science fiction tropes of robotic soldiers, the AI combatants are more mundane machines: autonomous planes and drones that can identify targets and defend themselves, and self-driving vehicles and artillery weapons. The AI-versus-AI combat is hailed as a success for avoiding human casualties, but does little to mitigate the effects of war on civilian populations.

19 By 2030, a major natural disaster sees its effects mitigated as a direct result of AI

Preparation for natural disasters is extremely challenging, with events like earthquakes and tsunamis offering little warning. AI tools begin to play a central role in predicting these events and help to greatly mitigate their impacts, such as highlighting areas for evacuation during an imminent disaster.

20 By 2030, a country appoints the first AI agent into an administrative role

In a similar vein to El Salvador adopting Bitcoin as legal tender in 2021, the ever-accelerating capabilities of AI and perpetual exasperation with human politicians leads to a country rolling the dice on appointing an AI agent to manage a government function by 2030.

21 Uncertainty about data transparency slows enterprise investment in AI model training in 2025

The introduction of the AI Act in the EU sees new laws with a risk-based approach designed to address the development, deployment and operation of AI systems. Transparency is a particular focus, with new requirements on companies to provide details about how models have been trained and the data used in the process. With questions remaining about the exact nature of these requirements, companies pause investment in the development of models pending clarity on the extent of the reporting and the visibility that third parties such as competitors have on the data used to train models.

22 A form of universal basic income is introduced in Europe to combat the increase in automation by 2030

Universal basic income has been widely discussed as a solution to automation that will initially raise unemployment throughout the Western world, yet no country has introduced it on a national scale yet. With automated taxis and trucks on the horizon, AI bots answering customer service queries, warehouses staffed by robots, and self-service kiosks at fast food restaurants, the nature of work is about to change and result in major structural unemployment. A European country, possibly one in the Nordic region, is the first to implement measures to tackle this societal change.

REGULATION

23 **Large players in generative AI strengthen their dominance over the next three years despite the efforts of regulators**

The generative AI space today promises a new diversity of participants. OpenAI, a company largely unknown just three years ago, leads a pack of start-ups and established hyperscalers building large language models. Over the next three years, the winners are those that can combine these models with context generated through data from a device, service or corporate database. Moves to combine data assets with AI models and outmanoeuvre smaller start-ups become a focal point for regulators, but the competitive advantage shifts inexorably to established names like Apple, Google, Meta and Microsoft that have the necessary assets.

24 **By the end of 2025, half of the gatekeepers defined by the Digital Markets Act are charged with non-compliance**

The effectiveness of any legislation comes down to its implementation and enforcement. To date Apple has been charged with breaching the legislation, and Alphabet and Meta are under investigation. By the end of 2025, three or four of the gatekeepers (Alphabet, Amazon, Apple, Booking, ByteDance, Meta and Microsoft) are charged with non-compliance. This illustrates the complexity of the legislation and the difficulty in untangling company strategy and policy born of two decades with no regulatory oversight.

25 **In 2025, an AI service begins offering parental control settings**

Online safety is a crucial topic for parents whose children are beginning to be exposed to all that is available on the public Internet. As the use of AI increases at school and in the home, an AI service responds to the needs of parents to offer branched services with parental controls that restrict the types of question, prompt and output that can be accessed through its service.

26 **The EU introduces specific regulation to limit "super bundling" by 2028**

With the subscription-based economy thriving and customers wanting to manage multiple subscriptions more easily, telecom operators are offering "super bundles" of services to simplify the process — and boost their revenue streams. The EU attempts to place limits on this type of upselling as it continues to regulate big tech companies through its Digital Services Act. It looks to ensure customers are not dependent on their operator and have the freedom to leave a contract and rejoin individual services such as streaming channels.

27 **Differences between the US and Europe in the regulation of AI intensify in 2025**

The EU's Digital Markets Act is a prime example of the diverging approaches to AI in the US and Europe. The Digital Markets Act is landmark legislation designed to ensure open innovation and competition in online platforms. Although the need for some regulation is broadly accepted in the West, Europe's legislative leadership is viewed by some factions in the US as an attack on US companies, and from 2025 it stifles development and deployment of AI services in Europe as leading tech companies such as Apple, Google and Meta delay or abandon the introduction of AI capabilities from the US, fearful of breaching regulations and incurring fines. With the EU again leading the legislative agenda with the AI Act, confrontation between the US and Europe rises, making the task of aligning legislation increasingly difficult.

GEOPOLITICS

28 China's Guo Wang satellite network emerges as a major competitor in global satellite Internet services

The Guo Wang low-Earth orbit satellite network intensifies competition in the global satellite Internet sector, offering an alternative to Western-owned constellations. The network is popular in countries targeted by China's Belt and Road Initiative, but its robust coverage and competitive pricing position it as a formidable rival to established networks in the West, like OneWeb and SpaceX's Starlink, for providing Internet and communication services.

29 To 2030, AI assets are increasingly weaponized in a new Cold War between China, Russia, Europe and the US

Western companies bar Chinese and Russian developers from accessing their AI models, increasing the appeal of home-grown models. Depending on the outcome of the presidential election, the US adopts a more isolationist stance. As covered in other predictions, Europe and the US take increasingly divergent approaches to the regulation and use of AI.

30 Before 2030, Russia uses anti-satellite weapons on Starlink satellites

The war in Ukraine has underscored the crucial role of SpaceX's Starlink constellation in military communications and reconnaissance. Amid escalating geopolitical tensions, Russia deploys anti-satellite weapons targeting Starlink satellites, aiming to disrupt these vital services. The action affects global Internet connectivity and military operations, escalating the militarization of space and prompting urgent calls for enhanced space security protocols.

CONNECTED DEVICES

31 **Gesture-based user interfaces see significant advancements over the next three years**

Improvements in sensor technology and machine learning algorithms deliver more accurate and responsive gesture recognition. Multimodal AI enhances the technology, helping to understand context and user intentions. Gesture-based interfaces become increasingly embedded in everyday technology, particularly wearables such as smartwatches, smart rings and smart glasses.

32 **The next three years see a rush of deals between makers of wearable devices and companies offering multimodal AI models**

The popularity of Meta's Ray-Ban glasses has revealed an appetite for wearable devices that can tap into AI models to understand the world around them. Other companies producing wearables scramble to secure access to leading models such as Meta AI, Google Gemini, OpenAI's ChatGPT and others to add a similar level of awareness and understanding to their devices.

33 **Meta resuscitates plans for wrist-worn wearables and launches a wristband by 2028**

Meta had reportedly planned to build a smartwatch before shelving the project several years ago. However, as part of its plans to build augmented reality glasses, the firm launches a wristband to track hand movements as a means of providing user input. It opts to do this rather than run an app on a competitor's smartwatch platform owing to a preference for integrated control between its devices.

34 **By 2025, a smartwatch feature that determines if the wearer has been spiked is launched**

The feature monitors vital signs such as heart rate, blood oxygen levels, temperature and types of movement. By analysing combined changes in these measurements, the watch can determine the likelihood that its wearer has been unknowingly drugged. It can then send a text message to an emergency contact, as well as vibrating and lighting up, letting the owner and the people around them know that something is amiss. Despite its limitations in loud settings and the potential for false positives, the mere presence of the feature is a good first step in deterring attackers.

35 **By 2028, the average household in the UK and the US owns 15 connected devices**

Our research indicates that the average household in the UK and the US currently owns between nine and 10 connected devices. This number rises as consumers embrace fully connected homes, in which convenience and cutting-edge functionality become everyday essentials.

36 **The Premier League strikes a deal for virtual reality broadcasting in 2030**

Sports and the broadcasting of live events are still areas of interest for virtual reality companies, with Apple highlighting them as a use for its Vision Pro headset, and Qualcomm forming an alliance to promote extended reality sports. The English Premier League strikes a deal with a leading industry player to broadcast some of its football matches in virtual reality.

39 **Samsung wearables offer a proactive sleep enhancement option by 2026**

Sleep has been a central tenet of Samsung's approach to wearables, and its Galaxy Watch and Ring products focus heavily on sleep tracking. Samsung builds on approaches taken by niche wearables players to add features such as gentle haptic feedback and stimulation to its wearables, which promise to help wearers enjoy a better night's sleep.

40 **Apple launches a smart ring by 2026**

Following the success of the Oura Ring and Samsung's debut of the Galaxy Ring, Apple launches a ring device. Given the company's long-held interest in personal health and well-being, the ring is a natural extension of its product line. Apple's brand allure and its design strength prompt strong demand from consumers. Additionally, the product aligns well with the company's growing commitment to gesture-based user interface models.

37 **By 2030, consumer robotics emerge as the next tech mega trend**

As the hype about generative AI subsides, attention turns to consumer robotics. Led by advances in Japan, the tech industry embraces robotics as a way to "put a body on AI". Freed from the constraints of a computer screen, generative AI starts to change the physical world.

38 **Ownership of smart doorbells in the US doubles by 2027**

Sales of smart doorbells are poised for significant growth, with ownership rising to more than four in 10 households by 2027. Growth is driven by consumer demand for convenience and security. A significant portion of this growth comes from first-time adopters.

41 **By 2026, members of two in five households in Western Europe own a smartwatch**

Our *Pulse: Connected Consumer* research shows that over a quarter of people in Western Europe already own a smartwatch. Ownership rises to 40% of households by 2026. Growth is fuelled by rising health consciousness among consumers, who seek real-time insights and convenient ways to monitor their well-being.

42 **Smart rings boost the fortunes of traditional watches, as some would-be smartwatch buyers opt for a smart ring instead**

Smart rings prove popular with people who already own a smartwatch, but they also provide some relief to traditional watchmakers. Those who have bought a premium smartwatch such as the Apple Watch Ultra may instead opt for an analogue device and wear a smart ring for health tracking.

43 In 2025, a major wearables-maker combines user data and generative AI to offer individual training and diet plans

Building on current services from niche players, the initiative's use of generative AI helps counter one of the major pitfalls of generic dieting or training plans: that everybody and every lifestyle is unique. The wealth of data that wearables and other personal electronics capture about our lives makes them ideal as a platform on which to build a virtual personal trainer or nutritionist and offer individual diet and training plans.

44 At least one major consumer electronics brand launches 5G RedCap headphones by 2026

Connections over 5G Reduced Capability (RedCap) networks can deliver a wireless experience good enough for limited applications such as streaming audio. The technology is added to headphones by 2026, allowing people to listen to music and podcasts on the go without their phones. The feature remains a niche offering that fails to achieve widespread use.
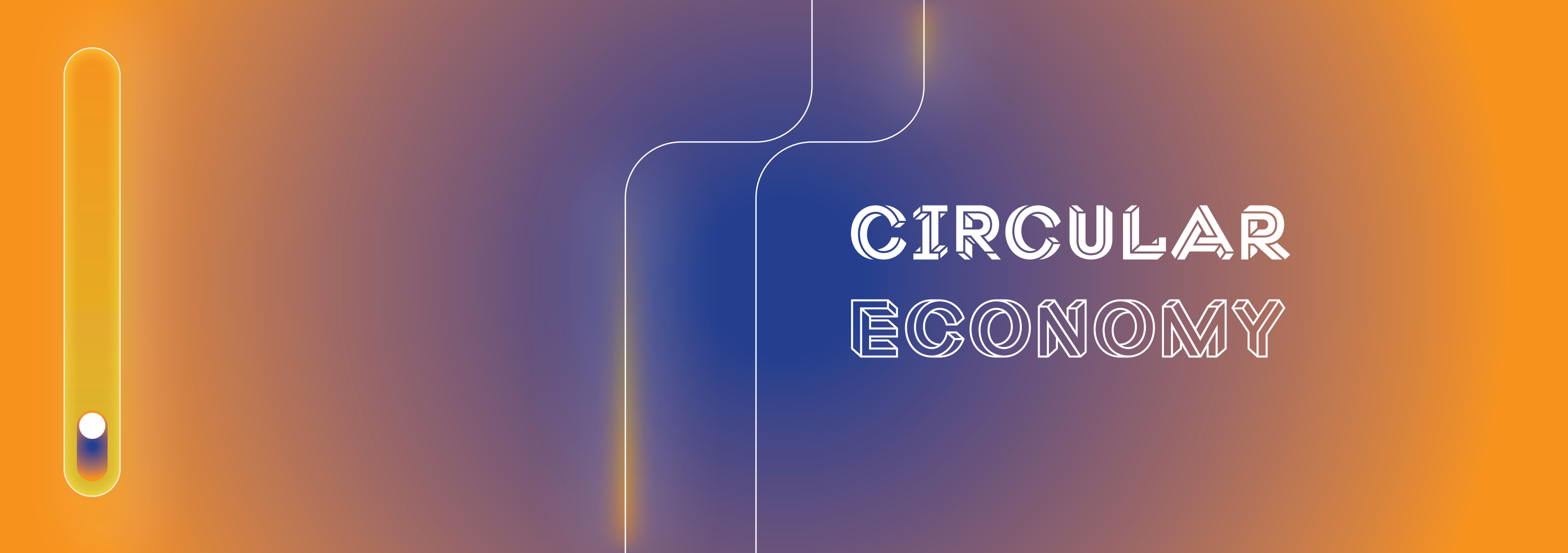
47 Microsoft launches an Arm-based hand-held games console by 2027

The company has been watching the progress of the Nintendo Switch since 2016. The arrival of Qualcomm's Snapdragon X silicon in 2024 and the ongoing success of the Linux-powered Steam Deck create a tipping point that prompts Microsoft to enter the hand-held console market. Backed by Microsoft's catalogue of game titles and its Xbox brand, the device storms past earlier Windows-based hand-helds from the likes of Asus and Lenovo.

48 In 2026, Amazon Pay expands significantly, becoming a competitor to PayPal, Apple Pay and Google Wallet

Building on a strategic partnership with Ripple formed in 2023, the expansion is underpinned by the use of Ripple's cryptocurrency for payments. Promising faster and more efficient payment solutions, and allied with Amazon Prime membership benefits, voice-activated payments and integration with Amazon's ecosystem of products and services, the system gains a significant foothold in the electronic payment market.

45 AI requirements cause a 20% rise in smartphone bill-of-materials cost over the next two years

The need for additional processing power and more memory for generative AI applications sees the bill of materials for smartphones increase substantially over the next two years. Although the introduction of new AI-based features in a range of applications encourages users to upgrade, the mounting cost of smartphones exacerbates a trend for lengthening replacement rates after a short-lived spike in device upgrades.

46 Garmin launches a pair of augmented reality sports glasses by 2028

The idea of augmented reality sports glasses is not new, with previous attempts by brands like Oakley arguably coming too soon as the cost and ability of the technology failed to match user expectations. However, the gradual refinement of lightweight displays in glasses encourages another company such as Garmin to revive this market with a pair of glasses primarily aimed at runners and cyclists.

CIRCULAR ECONOMY

49 **Peer-to-peer platforms for second-hand devices in Europe see a surge in growth in 2025**

Informal sales between individuals are subject to far fewer EU regulations. As the status of imported second-hand devices that do not conform to the region's e-waste rules remains unclear, businesses look for alternative routes to market. Platforms like eBay, Wallapop, Gumtree and OLX expand rapidly as businesses adopt consumer-to-consumer trading models to sidestep such regulations.

50 **Ireland becomes an important trading route for second-hand devices in 2025**

Traders and distribution hubs take advantage of the open border between Northern Ireland and the republic to bring devices into the European Economic Area through the UK, bypassing increasingly stringent EU regulations about devices allowed into the area without USB-C ports, CE marking or a declaration of conformity.

51 **Foldable phones fail to filter into the second-hand market, denting their adoption in the primary market**

We have seen the importance of the residual value of a smartphone in the primary market, where brands like Apple and Samsung advertise resale values when launching new devices. Foldables are far harder to refurbish and they struggle to take off in the secondary market as a result. Alongside consumer concerns about device longevity, this lack of residual value damages overall uptake for the category.

52 **In 2026, some smartphone trade-in rebates in Europe hit €500 for any device**

Intense competition and stagnant sales in the primary smartphone market, combined with growing demand for refurbished devices, prompt some European operators and retailers to offer substantial sums for any device traded in for a new phone, regardless of age and condition. Their efforts reflect current activities by US carriers and are supported by marketing campaigns by Apple and Samsung that emphasize trade-in benefits.

53 **By 2029, the flexibility of Open RAN and virtualized RAN kit creates a circular market for network hardware**

Numerous operators have sustainability goals that affect every part of their business. Although Open RAN has been marketed as an attractive option owing to its flexible choice of suppliers, its open interfaces also make it easier for operators to reuse older network equipment. Similarly, virtualizing the radio access network increases the use of standardized hardware that can be used for many purposes. The market takes off as first-generation hardware ages and is replaced to be shipped to less demanding locations where it can still play a role as an upgrade or where that equipment is still in use.

54 **By 2027, Amazon acquires a leading second-hand device marketplace**

Candidates include Back Market and Refurbed. Amazon expands into trade-in services and selling pre-owned equipment, cementing its position as the world's leading e-commerce business for both linear and circular channels.

55 **Amazon launches automatic insurance for purchases in the US by 2027**

The company mines its extensive data about its customers and their purchases to offer insurance plans for items bought in its marketplace. Insurance is offered as a one-click addition or bundled with some Prime subscriptions.

56 **Attempts to build an organized secondary market for headphones are hampered by the quantity of fake AirPods and Galaxy Buds**

Unlike in other device categories such as smartphones and tablets, a higher proportion of consumers may have accidentally bought a pair of fake earbuds. The difficulty of handling reverse logistics for fake devices traded in by customers leads some companies to abandon efforts to deal with this challenging segment.

CONNECTIVITY

57 By 2028, Internet of things devices using 5G RedCap outnumber 5G phones

The proliferation of devices supporting 5G Reduced Capability (RedCap) technology, including sensors, drones and cameras, means their number surpasses the total of 5G smartphones in use globally. The beneficial cost dynamics of 5G RedCap make the device ecosystem more accessible to enterprises and help satisfy increasing demand for interconnected smart devices in industries such as manufacturing, healthcare and smart cities, where they enhance operational efficiency, data collection and automation.

58 By the end of 2028, more than half of new 5G standalone networks support RedCap technology

According to GSA data, in May 2024 only 3% of operators with 5G standalone networks supported 5G Reduced Capability (RedCap) technology, which offers some features of 5G networks at a far lower cost. However, 23% are already investing in the technology, despite its infancy. As more applications of RedCap emerge, such as drones, power grids, robotics and transportation, operators globally accelerate their support for the technology.

59 An advanced market mandates cellular V2X technology in all new vehicles by 2029

The regulatory ruling reflects the growing amount of silicon in vehicles and the implementation of safety features such as intelligent speed assistance in vehicles in the EU in 2024. Cellular vehicle-to-everything (C-V2X) technology allows vehicles to communicate with other vehicles, traffic signals and pedestrians. In a bid to reduce collisions and create smarter, more-connected transportation systems, a national or regional regulator makes it a mandatory feature of all new vehicles by 2029.

60 By 2028, fixed wireless access over 5G RedCap networks eclipses LTE-based fixed wireless access in developing regions

Reduced Capability (RedCap) technology offers superior speeds for fixed wireless access but with lower equipment costs, so it is well-suited to rural areas or countries with low levels of fibre penetration, such as Africa and the Middle East. In developing regions, full 5G fixed wireless access is too costly, but the use of RedCap makes it more accessible and affordable.

61 **One in three households in India have fixed wireless access broadband by 2030**

New 5G networks in India are providing households with fast broadband connections for the first time. In a country where fibre-to-the-home penetration is less than 5%, wireless access networks allow operators to connect large numbers of households at a lower cost. By 2030, Reliance Jio successfully reaches its ambitious goal of 100 million fixed wireless access subscribers. The achievement underscores India's pivotal role in advancing digital inclusion and connectivity in one of the world's largest and fastest-growing telecom markets.

62 **Despite geopolitics, there will be a single 6G standard globally**

This is a lot of talk of technology standards splitting as the needs of different regions diverge and mistrust increases. But only through unified standards does the industry achieve the economies of scale that enable vast research and development costs to be spread across products that can be sold anywhere. The industry still remembers past mobile technology divisions and the pain they caused. As a result, progress to a common 6G standard in 2030 and beyond continues.

63 **6G arrives on time, with lead operators deploying the standard in 2030**

There is enormous negativity about 5G, with many operators making public statements about their limited willingness to invest further in it, let alone 6G, unless they see clear benefits. The improvements promised by 6G address many of 5G's rough edges, making 6G more attractive than 5G. The designers of the 6G standard work to make its implementation easier, clearer and less complex than the many 5G deployment options that confused the market and led to the damaging fudge that has been 5G non-standalone.

64 **In 2027, at least one operator uses the term 6G in its consumer marketing**

The decision to employ phrases like "6G ready" or "6G-like performance" proves controversial and receives strong criticism for hyping the next generation of mobile technology far too early. It echoes similarities with the 4G and 5G eras, in which some operators tried to gain early marketing advantages long before the first networks went live. Potential front runners include NTT Docomo, which has demonstrated 6G applications at MWC for the past two years, and AT&T, T-Mobile and Verizon, which are embroiled in a fierce battle for network supremacy.

65 **In a major European country, the first companies to acquire 6G mobile spectrum are not telecom operators**

In a major change for the industry, spectrum is first allocated to large corporate companies, universities, neutral host providers and governments. It reflects initial hesitancy by many European operators to invest heavily in another round of network upgrades before they have seen sufficient return on their expensive 5G deployments. Eventually, 6G spectrum is sold to operators for only a fraction of the cost of previous generations.

66 **By 2028, eSIM roaming providers such as Airalo, Holafly and Nomad are swallowed up by more-recognizable brands**

After a period of rapid expansion, the market consolidates around five or six major players as established brands in telecommunications and travel outperform specialist eSIM roaming providers with low brand awareness. A highly fragmented market with tight margins and limited opportunities for differentiation sees a flurry of mergers and acquisitions that quickly reduces the number of players. Telecom operators are involved in some of these deals as they seek to minimize the loss of roaming revenue.

67 **Airbnb offers its own eSIM as part of holiday rental services by 2025**

Travel-related companies such as easyJet and other airlines already offer eSIM deals as a way to combine key aspects of planning a holiday. Airbnb and other companies involved in overseas travel jump on the eSIM bandwagon. They launch roaming services by partnering with eSIM providers such as Airalo and Holafly. After a few years, the plethora of providers consolidates around a smaller number of well-known brands and telecom operators, as detailed in prediction 66.

68 **By 2030, more than half of TV viewing in the UK is over a broadband connection**

According to Ofcom, scheduled broadcasts by satellites or terrestrial transmitters accounted for 67% of total viewing in 2022 as viewers switched to IPTV programming. The regulator has also reported a 25% fall in the average number of minutes watched per person between 2018 and 2023. This trend away from traditional extended viewing is being driven by the rise of streaming platforms, growth in the proportion of Internet-capable TVs, and broadcasters' ambitions to achieve more-efficient service delivery.

TELECOM OPERATORS

69 **By 2026, a leading operator claims that nearly all its customer interactions are touched by AI**

Customer care has emerged as the leading near-term application of generative AI for operators. Keen to showcase its achievements in this field amid continued hype, an operator trumpets its progress in service automation and efficiency achieved by using AI in chat bots, on websites and to support sales agents with face-to-face conversations. In making the assertion, the operator points out that AI will remain an aid to human agents and not a replacement for them.

70 **In 2025, at least two operators announce plans to create separate "netco" and "servco" divisions**

In doing so, they spin off some network infrastructure into a separate unit, through a sale or as part of a joint venture. The aim is to place greater emphasis on serving consumer and enterprise customers, reduce debt and to attempt to break free from some of the constraints of the sector's heavy regulation. The moves follow the sale of Telecom Italia's fixed-line network in 2024 and the restructure of Denmark's TDC into two separate units in 2019.

71 **By 2026, a US carrier stops selling physical SIM cards in favour of eSIMs**

By 2029, none of the three major carriers offer a physical SIM. The move, alongside Apple's launch of an eSIM-only iPhone 14 model in 2022 and an eSIM-only Samsung Galaxy variant for the US in 2026, signals the beginning of the end for physical SIM cards in the US market. The proportion of subscribers using an eSIM climbs from its current 16% to 90% in less than a decade, making 6G the first eSIM-only network generation in the US. However, slow replacement cycles of phones mean that physical SIMs take a long time to disappear completely.

72 **By 2026, at least one major cross-border telecom merger is announced in Europe**

The deal aims to create greater scale amid continued struggles to achieve a meaningful return on investment in the region's fragmented telecom landscape. It is looked upon more favourably by regulators than recent high-profile in-market mergers, which have been subject to huge scrutiny. A possible combination is Belgium's Telenet with Dutch operator VodafoneZiggo; both have a shared parent in Liberty Global, which recently created a holding company to manage its operations in the Benelux region.

73 **A US carrier surpasses 100 private network deployments using its public network in 2025**

By integrating private network solutions with its existing public network capabilities, the carrier seeks to enhance reliability, scalability and cost-efficiency for its enterprise customers. The move is part of a widespread drive to increase the adoption of private 5G and LTE networks by various industry sectors in the US.

74 **In 2025, network operators introduce new family plans to address concerns about digital overload and excessive use of mobile phones**

These packages include the option of a feature phone for children and additional safety measures such as the ability to control access to the Internet and social media. Network operators support the plans with marketing campaigns about digital responsibility in an effort to avert scrutiny and intervention by regulators.

75 **In 2025, at least one European operator offers a mobile phone contract over five years**

The move reflects lengthening replacement cycles, the very high cost of some flagship smartphones and the continued squeeze on household budgets. Building on the tentative launch of a few four-year contracts, the offers quickly resonate with customers keen to spread payments over a longer period. However, they also provoke some unease among regulators for creating a potential barrier to switching provider.

76 **In 2026, an advertising watchdog mandates the use of hyperlocal real-world speeds in the marketing of broadband services**

The move forms part of a drive for greater transparency to help customers make informed choices and fair comparisons. Alongside any use of theoretical broadband speeds, the watchdog mandates that operators must disclose the average download speed at premises within a postcode — a precision of about 100 properties. This makes offers easier to understand and pushes the industry to focus more on improving service quality throughout the home.

77 **By 2026, the organizers of at least five major outdoor events partner with a neutral host connectivity provider**

They aim to improve connectivity at outdoor events that attract thousands of people to a relatively small area. Following moves to use neutral connectivity providers in stadiums, the organizers take ownership in a similar way to their control of other services like catering and sanitation. Attendees benefit from a more reliable service that supports rocketing use of video streaming and social media at events. The neutral host's infrastructure also underpins all digital ticketing and cashless transactions, improving the overall experience. Telecom operators benefit from cost savings from deploying temporary infrastructure, freeing them to compete in areas beyond connectivity.

78 **By 2027, a European telecom operator repositions itself as an enterprise specialist**

The consumer market in Europe is saturated and highly competitive; it demands a lot of capital expenditure by operators. By 2027, one European operator maintains the consumer segment as a cash cow and refocuses its operations to prioritize its business unit. It markets itself as more skilled and knowledgeable than its rivals' enterprise units in an attempt to take advantage of the high-growth segment. Its efforts are made viable by the wider adoption of 5G and 5G standalone networks, which can be used to power automation, the Internet of things and private networks.

79 **In 2025, at least three operators in Asia–Pacific partner with a strategic investor to build regional data centres**

The agreements resemble some of the "fibrecos" that have recently sprung up to support the deployment of full-fibre broadband networks. Operators look to duplicate this model to remove some of the risk of investing in their operational data centres; investors seek long-term returns from the expected surge in demand for capacity to support generative AI workloads. Operators in Asia–Pacific, which has been a recent hotbed of data centre activity, are among the likeliest to make the move.

NETWORK INFRASTRUCTURE

80 By 2026, two Open RAN suppliers consolidate to compete better with the likes of Ericsson and Nokia

Given the O-RAN Alliance's long-term goal of encouraging interoperability between suppliers, functionality and features, it is natural that smaller vendors see an opportunity to compete with Ericsson and Nokia. By 2026, two smaller Open RAN-focused companies join forces to offer end-to-end services. Candidates include Airspan, Mavenir, Parallel Wireless, Picocom, Radisys, Simnovus and Solid. It signals a shift in the competitive landscape, with consolidated Open RAN suppliers challenging the dominance of established players like Ericsson and Nokia.

81 By 2027, a leading telecom operator signs a strategic partnership with a major energy supplier

The initial aim is to achieve synergies through joint infrastructure deployment. This includes areas such as smart metering, small-cell deployment on street furniture, securing joint access to real estate, electric vehicle charging, combined power and network cabling at specific venues, and deploying renewable energy to run telecom networks. Eventually it leads to bundled energy and telecom services. In a possible scenario, the move is encouraged or even mandated by a government, amid growing focus on national security and sovereignty in the context of escalating geopolitical turbulence.

82 During 2025, Hewlett Packard Enterprise acquires an Open RAN provider

Hewlett Packard Enterprise strengthens its position in the private 5G network market by acquiring a leading Open RAN equipment supplier. The move aims to enhance the firm's capabilities in delivering secure and customizable 5G solutions to enterprise customers, employing Open RAN technology to enable flexible and efficient deployment of private 5G networks. The acquisition builds on the acquisition in 2023 of core network provider Athonet, and the pending acquisition of Juniper Networks.

83 By 2029, a mobile network suffers an outage because of an attack on its satellite-based timing system

The geopolitical situation continues to worsen. There have been numerous examples of interference in GPS systems in parts of Europe as low-intensity conflict spreads. Time-division duplex communications require extremely precise timing to work and 5G base stations routinely include a GPS timing unit to ensure accuracy. Although there are multiple efforts to offer alternatives to satellite-based timing over GPS, they do not arrive quickly enough to avoid a mobile network suffering an interruption of service.

84 By 2027, a European operator decides to switch its entire radio access network to Open RAN

Offering open interfaces in the radio access network has gained renewed momentum in 2024, but deployments are still the exception, not the norm. Beyond greenfield operators, few operators have yet embraced Open RAN across their entire network. This changes as the flexibility and economic opportunities of Open RAN prove enticing to investment-cautious European operators. However, they still wish to maximize the life of their existing equipment, which means it takes several years before they move ahead with Open RAN to this extent.

ENTERPRISE

85 African states such as Nigeria, Kenya and Ethiopia become regional powerhouses in data centres and renewable energy by 2028

The foundations of this development lie in China's Digital Silk Road initiative, launched in 2015 as part of its Belt and Road strategy. Its investments, along with the continent's vast land mass and solar energy potential, contribute to significant leaps in the data centre and power-generating capabilities of its more stable and populous nations. This leads to wider participation by Western industries keen to strengthen their foothold in Africa, as well as support from Western governments with an eye on stemming economic migration by encouraging local development.

86 By 2030, a leading tech company claims to be the first to achieve carbon-negative data centres

Increasing pressure from investors, customers, regulators and the general public is compelling tech companies to prioritize environmental sustainability. Through a combination of technological innovation and carbon offsetting, a leading tech company claims that its data centres are responsible for reducing, rather than creating, carbon dioxide emissions. Critics argue that the technical accuracy of the claims does little to address the wider impact of soaring data centre usage to power AI services.

87 By 2026, a standards body offers a register of approved partners for industry-specific solutions

Simplification is a major imperative for organizations faced with increasing complexity in IT operations and a challenging regulatory environment. A standards body takes heed of the rise in strategic partner relationships forged by technology suppliers and service providers to deliver targeted application workloads and services in certain industries. Providing a register of successful partner relationships not only sees a shift in ecosystem dynamics, it also offers a simplified approach to adopting technology, improved quality of service and more-streamlined adaptation and innovation.

88 By 2026, an AI-powered system helps companies match candidates to job roles

A potential example springs from a collaboration between IBM and a government agency using an expanded version of IBM's watsonx Orchestrate skills portfolio matrix. The system allows companies to assign a level of importance to different role attributes such as technical skills and experience, and — more importantly — to soft skills and personality traits. It creates greater fluidity in internal job markets, improves social mobility, broadens the talent pool and so raises wider national prospects. It may also help reduce the "brain drain" that many nations are experiencing.

89 **By 2025, several publicly traded companies include the operational usage of their IT systems in financial reports**

A drive for greater visibility into the infrastructure efficiencies of IT operations puts pressure on companies to provide more meaningful and relatable sustainability measurements. Investors and regulators look for greater levels of accountability in the IT infrastructure and operational choices made by organizations. They are keen to see the high utilization rates of mainframe platforms repeated in other IT systems, along with innovations in power usage, performance improvements and a reduction in the amount of hardware.

90 **By 2027, digital twins are a common aid to self-installation of customer premises equipment**

Currently, indoor network equipment struggles to reach consistent levels of penetration and reliability, often needing a site visit by an engineer. As operators focus on delivering connectivity "to the room", they work with hardware manufacturers to offer digital twins and a smartphone app that mirrors home and commercial environments and help users place equipment in optimal locations.

91 **By 2028, mental health virtual assistants become a standard offering in employee well-being programmes**

Capable of delivering immediate responses to a wide range of employee concerns, offering empathetic advice and guiding individuals toward suitable resources for further assistance, assistants offer personalized support through natural language processing and machine learning algorithms to adapt responses based on individual preferences and emotional cues.

92 **Real-time holograms become a part of enterprise collaboration by 2029**

Meetings and collective spaces are transformed by the technology. ARHT, a leader in hologram technology, evolves its "virtual global stage" product to become the first company to broadcast life-sized holograms to remote locations that can interact with colleagues in real time. A combination of hologram technology and virtual and augmented reality also inspires collaboration spaces akin to Star Trek's holodeck. These immersive environments are used for meetings, training, team-building activities and employee well-being.

93 **The first AI-powered digital twin of an enterprise IT infrastructure is demonstrated in 2027**

A digital twin representation takes the current crop of observability and monitoring services and supercharges their logging capabilities to offer a multidimensional visualization and digital interaction layer. The twin is similar to 3D models of molecules in pharmaceutical development, digital twin concepts in manufacturing, and representations of network topologies created by the likes of Huawei and ZTE. It can be viewed through a virtual reality headset, and offers organizations new capacities for explainability in IT operational topologies. Of particular benefit is the ability to observe the impact of deployment changes on sustainability, costs, work effort and security before they are made. This leads to more-effective decisions and improvements in quality and productivity.

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A guide to key themes and companies. Number refer to each prediction, not page number.

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