AN FNTV REPORT:

SHOCKER! 5G WILL EVENTUALLY SUPPLANT WIFI *EVERYWHERE*

Author: Stephen M. Saunders MBE, Chief Satirist, FNTV

FIERCE Network
FNTV

FIERCE Network

FNTV

Table of Contents

WiFi's Original Mission 2
Private 5G in Heavy Industry 3
Integrating OT and IT over 5G 3
Enterprise Consolidation 4
Why Enterprise IT Hates This 5
Consumer Affairs 6
Confusion & Complexity 7
5G Hyperfailers 9
History, Economics & Tech Evolution 10
Executive Summary 10
The 5G Startup Scene - An Index 12
About the Author 13

- **WiFi is a LAN standard. 5G is a force multiplier for the new global digital economy.**
- **5G's expansive capabilities are now challenging the dominance of Wi-Fi, signalling a potential shift toward a unified communication infrastructure.**
- **At stake in the WiFi-versus-5G contest is ultimate control of the entire IT ecosystem.**
- **APIs and a strong partner ecosystem are crucial for connecting telecom and industrial systems and scaling innovative digital solutions.**
- **Industry, enterprise, and consumer markets all stand to benefit from ubiquitous 5G deployment, but in different ways, and over varying time frames.**

5G will replace Wi-Fi in both enterprise and industry networks. At some point, it will oust Wi-Fi in consumer markets as well.

There, I said it. Fight me.

This isn't just a fight between 802.11 and 5G. There's something much bigger at stake: control of the IT ecosystem. Since the mid-1990s, business networks have been dominated by enterprise vendors, marching in lockstep with office automation companies. Now, the telecom industry has rolled out an alternative approach that threatens that hegemony, and the enterprise types don't like it, not one bit.

Mine is not a popular opinion in the media and analyst communities, who find any suggestion that 802.11 may not be the eternal champion of local area connectivity extremely triggering. One industry analyst recently described the concept of 5G as an enterprise LAN Wi-Fi replacement as "essentially a myth."

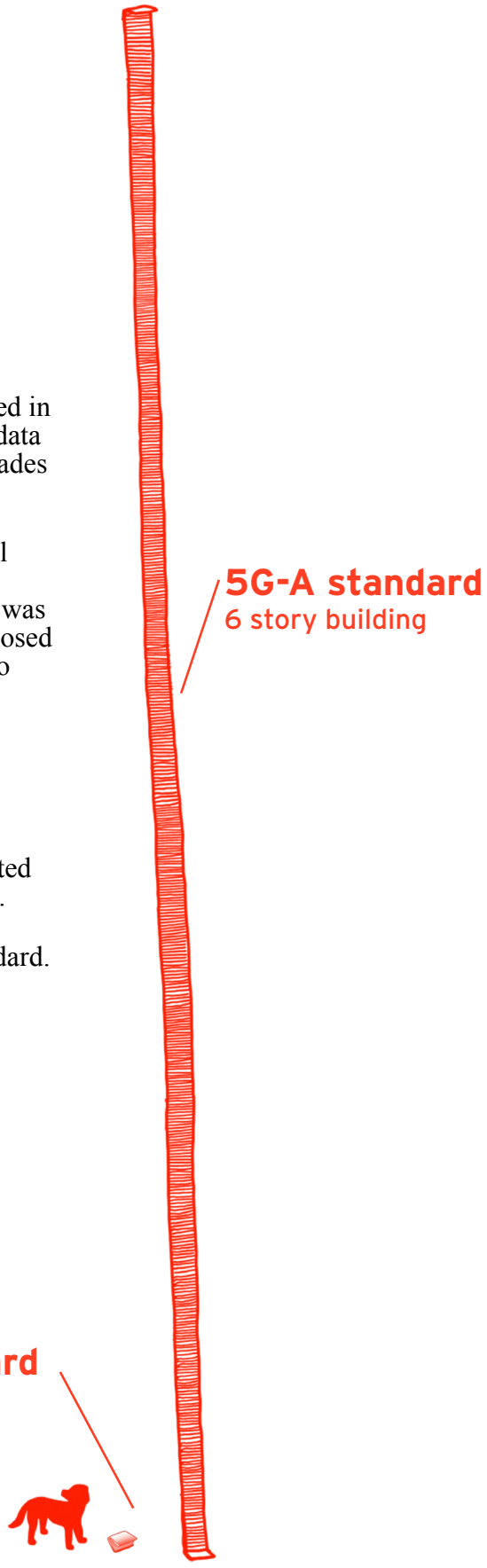
Wi-Fi's Original Mission

The truth is that this isn't a level playing field. WiFi was first developed in the early 1990s as a solution to a specific problem – how to fire-hose data packets between local network users without using a cable. Three decades later, despite upgrades, its mission remains essentially unchanged.

5G isn't like that. When it arrived in 1992 — the same year the Mortal Kombat arcade game made its debut, but a full five years before Wi-Fi — the GSMA's 2G standard didn't even support packet data; it was a circuit-switched voice technology. Over the years, it has metamorphosed entirely from a means of chatting over a wireless wide-area network to something unique, defining an intelligent, cloud-native, highly secure communications ecosystem that will span the globe, providing the foundation on which the next digital industrial revolution is built.

That disparity is reflected in the scale of the documentation for each standard. The entirety of the latest 802.11 Wi-Fi 7 spec fits inside one binder. If you were to print out the 5G standard, along with all its related documentation, it would result in a tower of paperwork six stories tall.

This is a case of form following function: WiFi is merely a LAN standard. 5G? It's a socio-economic force multiplier for the entire world.



The Wi-Fi 7 spec fits inside a binder.
Printed out, 5G is a tower of paperwork, six stories tall.

Private 5G in Heavy Industry

5G private networks are gaining momentum rapidly in heavy industries, such as transportation and manufacturing, where the advantages of 5G over Wi-Fi make it an obvious choice.

As a dedicated wireless network that provides standalone 5G (5GSA) connectivity within a specific area, such as a mine, large factory or port, private 5G can often be deployed more cheaply and efficiently than crowding a factory with Wi-Fi access points.

In contrast, Wi-Fi has acquired a hard-to-shift reputation for capriciousness – often more of a notwork than a network. Think 3-nines of uptime, or almost nine hours of downtime per year (insert horrified telecom expression here).

White-collar enterprises can talk themselves into using WiFi for VoIP or printer access, but that kind of hit-or-miss availability won't cut it for the OT (operational technology) networks used by blue-collar heavy industries (those without carpets).

Fixed Wireless Access (FWA), a subset of 5G, is also playing an increasingly crucial role in the cellular technology's popularity within heavy industries, where its ability to provide dedicated spectrum and secure, high-quality, highly reliable connections makes it an ideal alternative, or addition to, traditional fibre-based solutions.

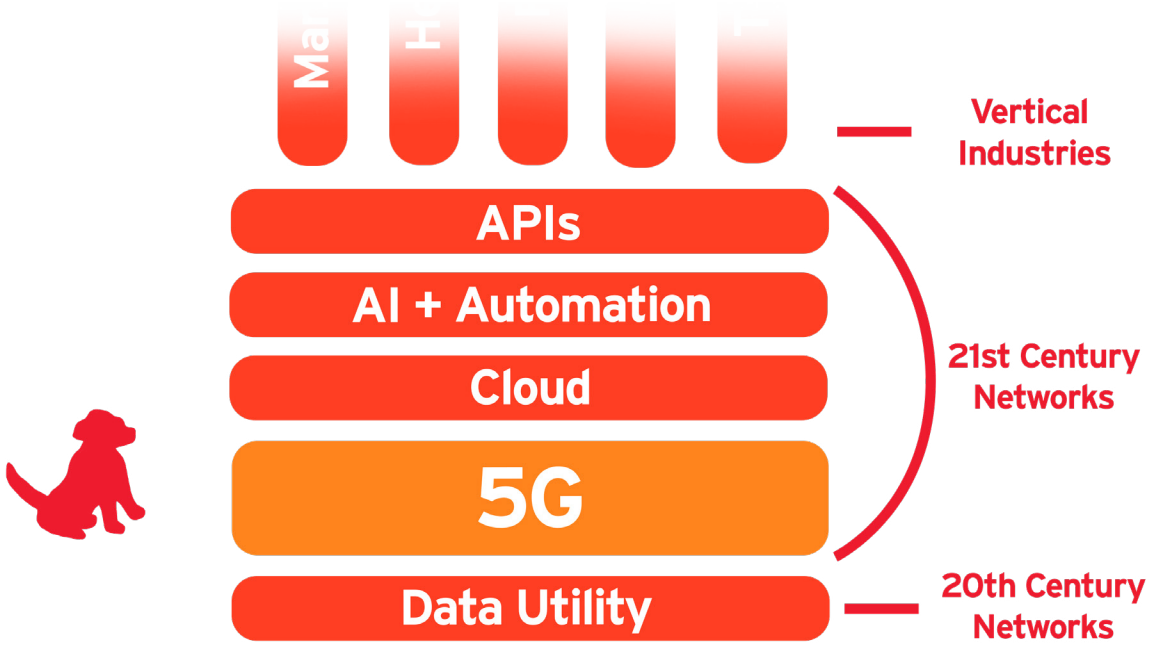
Integrating OT and IT over 5G

Beyond reliability, deploying a state-of-the-art private 5G network provides vertical industries with a highly sophisticated and dependable network layer, enabling organisations to focus on the critical work of reimagining their businesses for the digital age by integrating horizontal network infrastructure with their bespoke, highly specialised industrial OT environments.

Integrating industry services and applications with virtual and AI-enabled 5G infrastructure using application programming interfaces (APIs) is the most challenging part of the next industrial evolution – a complex and essential task, making the conventional challenge of "building a reliable local area network" seem almost trivial in comparison.

The good news is that more than half a dozen industry organisations are working on integrating industrial applications running on Operational Technology (OT) into 5vG networks, including trade-show organiser GSMA, and the IEEE electricians' collective. (And the bad news is that more than half a dozen industry organisations are working on integrating industrial applications using OT into 5G networks).

These industry bodies have a part to play in solving the industrial integration challenge, but the more significant activity is happening outside of them – in partner ecosystems that are emerging organically in every industry, with participants working together to add a communications link to the supply chain and drive forward the mission of global industrial digitalisation.



Telecom serves as the essential horizontal comms infrastructure to support the digitalisation of the entire world economy. APIs are at the top of the stack, linking the telecom world to the unique OT environments operated by industries. Traditional 20th Century data network sits at the bottom. And in the middle, pulling the entire thing together, linking old to new, is 5G - the lingua franca of the new digital global economy.

Enterprise Consolidation

For white-collar enterprise businesses, the choice of Wi-Fi and 5G involves a different set of criteria compared to those used by industry organisations, extending beyond the two traditional LAN metrics: data throughput (how fast) and cost per node (how much).

On a cost-per-seat basis, private 5G gear is five times or more expensive than high-quality WiFi equipment. However, per-node pricing is a red herring for enterprises, who should instead be focused on the long-term economic metrics of total cost of ownership (TCO) and return on investment (ROI).

5G has the potential to deliver groundbreaking benefits on both fronts. Eliminating islands of enterprise Wi-Fi connectivity simplifies network management by allowing businesses to monitor and manage their networks end-to-end using a cloud-enabled system, removing the dissonance between competing IT and WAN management products.

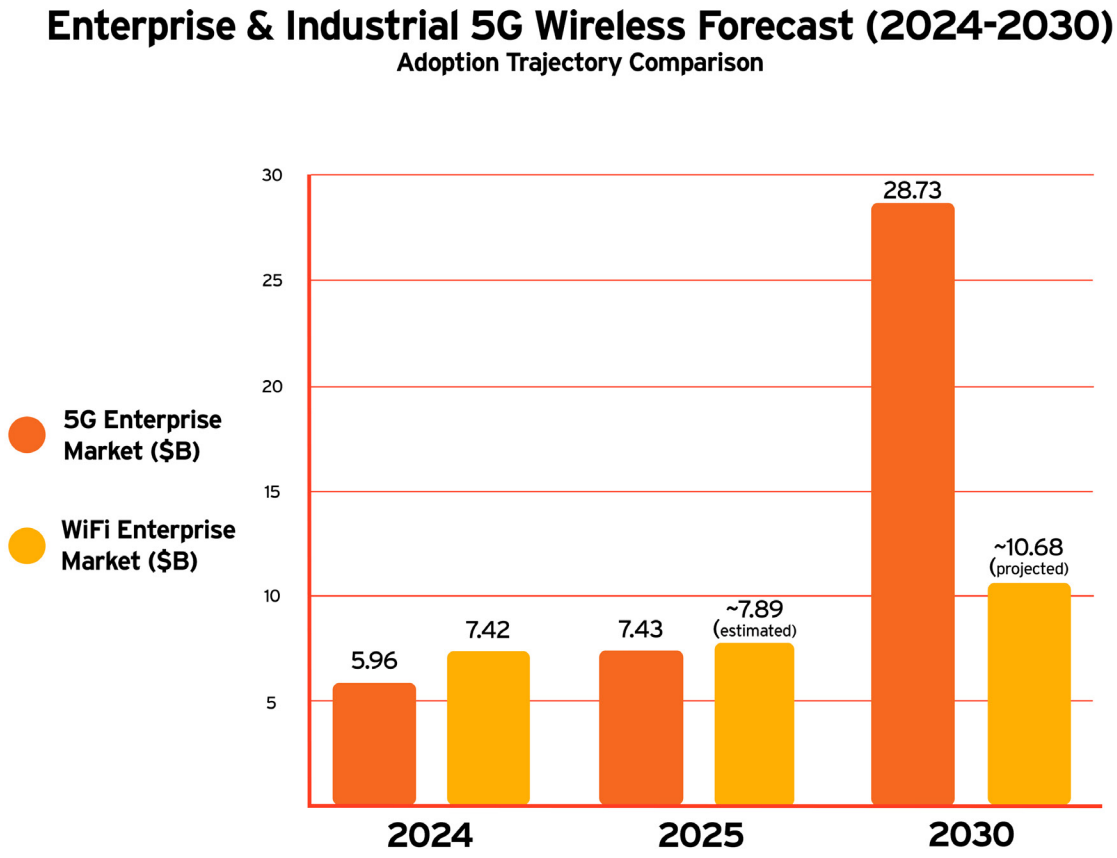
This reduces TCO and makes the consistent application and monitoring of policies for security, quality of service, and other key metrics significantly easier.

It also enables enterprises to build new digital strategies on a universal, policy-managed layer, improving ROI and widening their competitive moat. (As with vertical industries, the development of robust APIs and developer environments is essential to achieving these goals).

Like vertical industries, enterprises are also deploying 5G in FWA configuration, delivering high-speed connectivity without the necessity for expensive fibre installations.

Why Enterprise IT Hates This

WiFi and 5G will continue to coexist for now, but in the long term (and we're talking a decade or so, here) 5G has the potential to liberate enterprises from the grip of IT vendors such as Cisco, Extreme, and HPE, along with their associated ecosystem of integrators and IT departments.



Methodology: Wi-Fi market projections beyond 2024 are estimated based on the provided CAGR

Source: Markets and Markets

Enterprise factions within the industry become quite agitated about 5G's potential to unify the oil-and-water cultures of LAN/enterprise and WAN/telco. They're worried the telco types might be cooking up a hostile takeover of their ecosystem.

Ericsson's first-mover activities in this market won't make them feel any better. One of the world's five 5G incumbents, the Swedish vendor has already quietly developed a system built on 5G that can substitute for conventional enterprise IT approaches. Called Enterprise Virtual Cellular Network (EVCN), the end-to-end 5G product is currently being piloted with Ericsson's US workforce, enabling remote and mobile users to easily and securely connect to corporate tools and applications without having to faff around with VPN configurations and public Wi-Fi. End users access resources using 5G-equipped laptops, connecting to T-Mobile's national 5G network.

I was given a cool demonstration of EVCN by its architect, Andrew Pratt, at this year's MWC show in Barcelona. Ericsson placed the product in the "invitation-only" confidential part of its Hall 2 mega booth. This low-key approach to what is a significant launch is likely due to a desire to avoid suffering the slings and arrows of outraged WiFi zealots.

Regardless of potential pushback, other 5G vendors – including Cisco, Huawei, Mavenir, and Nokia – are all at various stages of developing or selling solutions that integrate private cellular networks with enterprise automation and cloud management.

Consumer Affairs

Of the three potential markets, consumer WiFi is the most resistant to the 5G putsch. As today's near-automatic choice for everything from home entertainment to airport concourses, Wi-Fi is assured a long half-life, but not an indefinite one. There is now no meaningful difference in throughput for end users between WiFi and 5G, negating the wireless LAN standard's long-standing speed advantage over cellular technology.

More importantly, 5G's omnipresence will eliminate the friction experienced by consumers transitioning from 5G cellular coverage to, say, a Wi-Fi network in a coffee shop.

That might not seem like a big deal today, but in 20 years, the idea that people once traded their digital identity, in the form of their email address, for free Internet access in commercial outlets will seem as bizarre as the process of 1990s dial-up is incomprehensible to Generation Z ("and then we had to key in a telephone number, with a few extra commas to give the modem time to find the right Internet tube," etc.).

For the younger generations, the shift from Wi-Fi to 5G is just another element of their "bandwidth entitlement" – the larger move away from fixed broadband subscriptions in favour of exclusive, untethered access to high-speed connectivity.

There's no doubt that many consumers – young and old -- would leap like salmon at the chance to enjoy seamless universal high-speed network access as part of their existing 5G plans. Still, they can't buy what vendors aren't selling. There is considerable reticence on the part of laptop manufacturers to integrate cellular communications as a standard feature of their product offerings, when they can simply snap a $10 Wi-Fi modem into the M.2 slot on their laptop motherboard.

Admittedly, 5G hardware is somewhat more expensive for them to equip than Wi-Fi, and it also incurs additional technical and regulatory complexity. However, the more relevant delaying factor is cultural. Laptop manufacturers are part of the "axis of enterprise," viewing anything telecom-related with innate antipathy, regardless of whether their customers want it (they do).

Things are finally progressing, albeit in baby steps. Qualcomm has declared that onboard 5G is a key part of its revenue diversification strategy. Its Snapdragon X Elite modem, which combines 5G and on-device AI, is expected to appear in premium laptops by the end of the year.

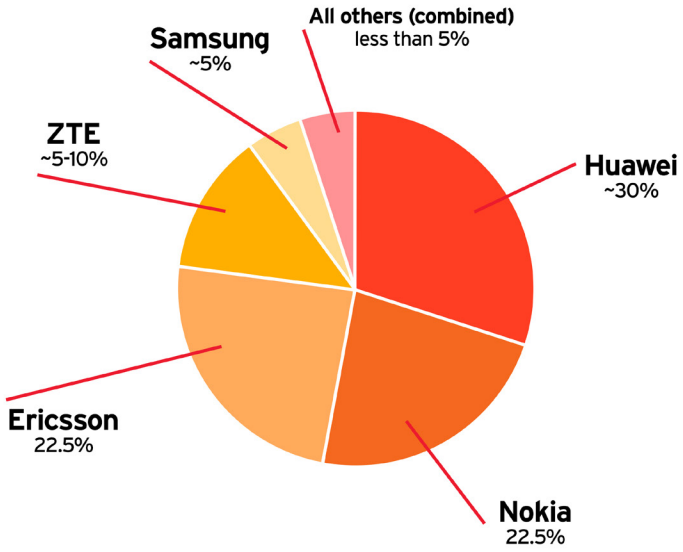
Confusion & Complexity

Another barrier to private 5G adoption is the confusion being propagated by both analysts and carriers. Deloitte, Gartner, and Omdia have all released private 5G reports and forecasts this year that have resulted in industry puzzlement and merriment.

The market research companies agree that private 5G is dominated by five vendors: Ericsson, Huawei, Nokia, Samsung, and ZTE. Combined, these companies control approximately 95% of the global market (see figure 1). However, they are all over the map in terms of which ones are the market leaders.

Global Market Share of Private 5G Vendors
(Enterprise & Vertical Industry Segment 2023-2024)

Focus: *Direct providers of private 5G solutions for industrial and enterprise deployments*



Methodology: Includes only fully isolated private 5G networks, not sort-of-private or private-like public 5G networks implementing slicing or quality of service (QoS) features. Excludes 5G resellers and integrators. Based on aggregated market share data from vendors and research firms, filtered to eliminate errors and instances of flagrant stupidity.

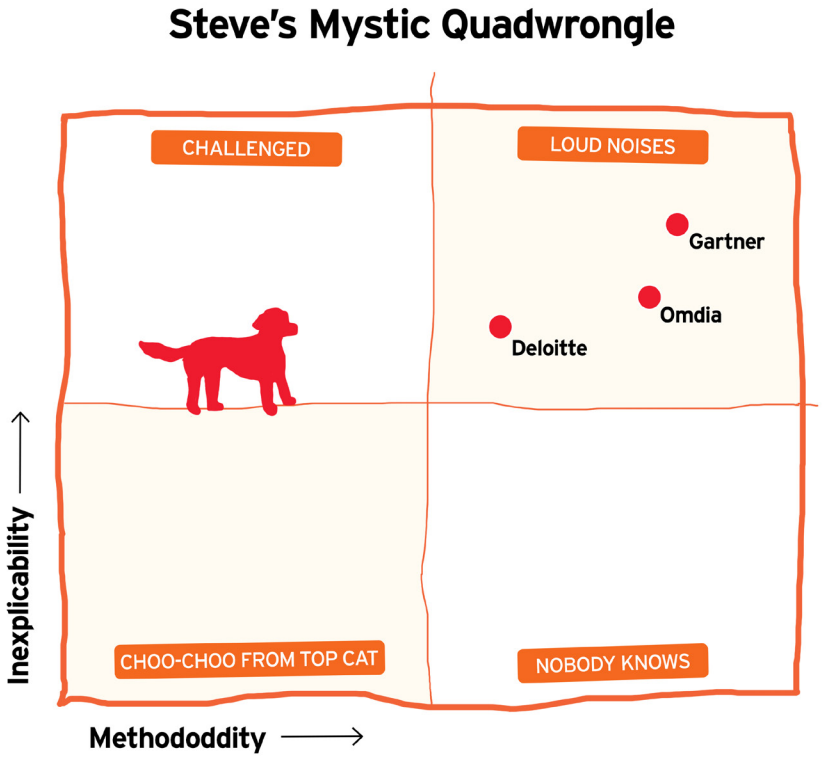
Source: Saunders/FNTV

For example, Samsung has a solid reputation in private 5G, accounting for a respectable 5% of the global market share. Yet, Omdia ranked it dead last in its recently published ranking of nine vendors, positioning it behind three startups that collectively control significantly less than 0.25% of the market.

And Gartner's analysis appears to have been delivered by clown car. Its Magic Quadrant muddled 4G and 5G technology while conflating the companies that manufacture private network technology with the service providers that purchase their products and the systems integrators who install them. It also managed to entirely omit Huawei and Samsung, a third of the global market, rendering its effort pointless. (For more on analysts' inability to analyse private 5G, see below).

Carriers such as AT&T, Vodafone, and Orange have further added to the muddle by describing the services they deliver over public networks using network slicing as "private 5G" or "dedicated 5G." However, to be genuinely private, rather than merely "a bit private, maybe," 5G networks must feature fully isolated RAN and core and utilise dedicated spectrum. Carriers have a history of stretching the definition of 5G to sell more services. It is disappointing to witness them resorting to the same tactics once again.

The absence of coherent analysis or marketing makes the job of companies looking to pick a private 5G partner harder, as does the explosion in the number of startups delivering technology for specialised private 5G applications. There are literally dozens of smaller companies playing in this space; I strongly recommend reading the excellent coverage of this thriving new sector by my colleague, Dan Jones, over on Fierce Network (and see "The 5G Startup Scene – an Index," below).



Source: FNTV/Saunders May '25

Leading analyst firms and market research companies have struggled to make sense of the exciting private 5G market.

5G Hyperfailers

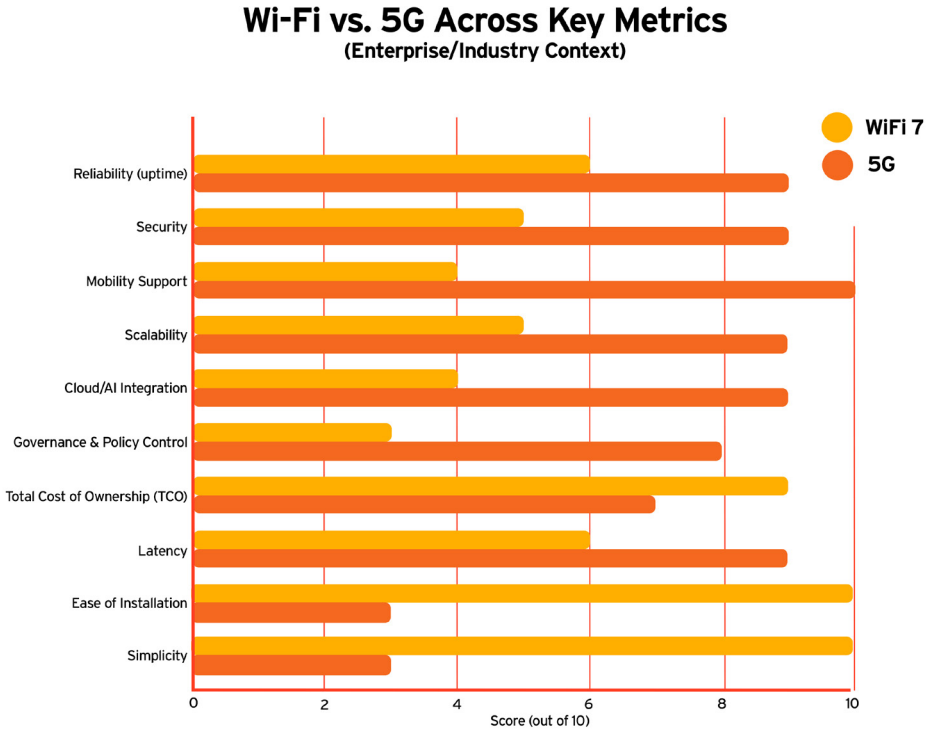
Beyond market misunderstandings, 5G has two characteristics that will slow take-up: its complexity, and the need for licensed wireless spectrum.

On the bright side, these drawbacks present carriers and service providers with a significant opportunity to expand their business models beyond bandwidth by offering companies value-added services that offload the intricacy of 5G and address onerous licensing responsibilities.

Not everyone wants to undertake this work. AWS recently exited the private 5G market because it was harder than it thought it would be (recall that Google made the same mistake with its fibre business).

But then again, hyperscalers aren't in the business of building a digital infrastructure that revolutionizes the world and unfetters the economies of the Global South; they're in the business of identifying the shortest path to the largest pile of money and then not paying taxes on it. Growing a ubiquitous 5G global biome will take decades, which is "the job" if you're a company like Ericsson or Nokia that has been around for a century, or has a hundred-year plan, like Huawei. These companies have no issue with the mission's longevity.

And, again, this is also a potentially game-changing opportunity for carriers to reinvent themselves beyond their role as data utilities in the 21st Century, bringing their understanding of wireless technology to bear in a territory where hyperscalers like AWS and Google lack the gumption to play.



Methodology: Sure.

Source: FNTV/Saunders

History, Economics, & Tech Evolution

The history of the communications industry demonstrates that 5G is poised to take over the world (eventually).

I started my journalism career writing about local area networks. In 1997, I authored a book (seriously, a literal book, made out of paper) about high-speed local area networks for McGraw-Hill. At the time, vendors and standards groups were pushing eight different options for local area networking, sparking an entertaining industry bun fight. Ethernet ultimately emerged victorious, and for a simple reason: the industry didn't want multiple networks; it wanted to consolidate on one (less than two).

The same dynamic applies today. When confronted with a network fork in the road, the communications industry innately prefers a single path, thank you very much (this is why NFV has acceded to cloud, ATM has lost to IP, and MPLS has been overtaken by SD-WAN).

The religious nature of the ongoing contest between WiFi and 5G may take a couple of decades to resolve, but ultimately, this is a Highlander - there can be only one.

5G's dominance is assured not merely by the technology itself, but by the fundamental shift in the role of communications in the 21st Century.

We have moved far beyond basic functions like making long-distance phone calls or using email. Digital technology now provides the foundation upon which all aspects of human quiddity depend. Culture, politics, industry, business, warfighting - all are now reliant on a digital ecosystem that demands a pervasive, ubiquitous means of communication.

That means cloud networks, optical networks, and AI. But also - and this is written - 5G.

Executive Summary

Scope of Impact:

Unlike Wi-Fi's narrow LAN focus, 5G acts as a force multiplier for the entire digital economy, transforming connectivity from local to global scale and supporting autonomous, intelligent, and secure networks.

Control of the Ecosystem:

The core battle isn't just about speed or cost—it's about who will ultimately control the future of the global IT ecosystem. Industry consolidation around a single, dominant standard is likely to be the outcome, with 5G poised to lead.

Evolution of Cellular Technology:

Cellular technology has evolved over three decades—from circuit-switched voice to a cloud-native, highly secure, and intelligent communication ecosystem that will underpin the next industrial revolution.

Technical Foundations:

While Wi-Fi was designed in the 1990s to move data packets locally, 5G's comprehensive ecosystem supports autonomous, secure, and flexible connectivity across both local and wide-area networks, empowering industry and enterprise applications.

Industry Adoption & Reliability

Heavy industries such as transportation and manufacturing are rapidly adopting private 5G networks due to their superior reliability, security, and native support for AI and cloud integration. Despite higher initial costs, 5G's network consolidation offers significant long-term reductions in total cost of ownership (TCO) and boosts enterprise ROI.

Vendor Innovation

Leading vendors like Ericsson, Nokia, Huawei, Mavenir, and others are actively developing solutions that seamlessly integrate private cellular networks with enterprise automation, AI, and cloud management. Dozens of startups have also emerged offering specialised private 5G technology and services.

Consumer Market Outlook:

While Wi-Fi will continue to dominate home connectivity for the foreseeable future, 5G's comparable throughput, ubiquitous coverage, and enhanced security are challenging Wi-Fi's long-term relevance and accelerating a shift toward seamless, high-speed global connectivity.

FWA Value Prop:

FWA uses 5G spectrum to deliver high-speed data wirelessly. It's a flexible, scalable, and cost-effective alternative to fibre. When deployed in fully isolated private 5G networks, FWA enables secure, high-speed connectivity for a variety of industrial and consumer applications.

Future Industry Landscape:

History favours consolidation around a single dominant standard. With its technological and strategic advantages, 5G is positioned to become the backbone of the global communication infrastructure.

Strategic & Long Term Impacts:

Beyond connectivity, 5G acts as a foundational platform integrating AI, IoT, and cloud technologies—redefining industry, commerce, and society at large. Over the next decade, 5G will increasingly supplement and eventually replace traditional local and wireless networks, impacting every sector.

Source: Saunders/FNTV

FIERCE Network

FNTV

The 5G Startup Scene - An Index

The private 5G opportunity has sparked a surge in startup activity. Here's who's doing what…

Private 5G Startups

Abside Networks (https://www.abside-networks.com/) – Abside provides private networks for federal and military users

Accelleran (https://accelleran.com/private-5g/) – private 5G radios and RAN controllers

Airspan Networks (https://airspan.com/) – indoor/outdoor radios, largely transport-focused 4G/5G radios

Amarisoft (https://www.amarisoft.com/company/about-us/) – virtualized private 4G/5G RAN

Antevia Networks (https://www.antevianetworks.com/products) – virtualized private 5G RAN

Askey (https://www.askey.com/solutions-detail/smart-5g-private-network/) FWA/private network radios

ASOCS (https://asocscloud.com/cyrus/) industrial private 5G

Ataya (https://www.ataya.io/products/) Indoor/outdoor private 5G radios

Baicells (https://www.baicells.com/) –LTE/CBRS/5G private network radios & routers

Benetel (https://benetel.com/ran550/) – Indoor 5G O-RAN private network

BLiNQ Networks (https://blinqnetworks.com/) 4G/5G enterprise indoor small cells

BubbleRAN (https://bubbleran.com/products/mx-pro/) 5G private network systems

CampusGenius (https://campusgenius.com/) Provides 5G private networks foe enterprise campuses

cellXica (https://www.cellxica.net/) Provides 5G private radios, is working with AttoCore to provide a full private networking system

Celona (https://www.celona.io/) 4G/CBRS/5G private networks

Eridan (https://eridan.io/product/) lightweight 5G O-RAN equipment that can be used for private networking

Firecell (https://firecell.io/) private 5G networks

G REIGNS (https://www.reignnet.com/pr) private 5G in-a-box

Highway 9 Networks (https://highway9.com/) Mobile cloud/5G private network/automation

Innowireless (Qucell) (https://www.innowireless.com/pages/kor/main.asp) Cellular provider

JMA Wireless (https://jmawireless.com/jma-solutions/private-wireless-solutions-2/) US-based cellular vendor providing 4G/CBRS/5G private networks

JET Connectivity (https://jet-eng.co.uk/5g-radio-products/) Marine-based 5G base stations and routers

Mavenir (https://www.mavenir.com/) O-RAN-focused cellular vendor that is moving into 4G/5G private networks

Moso Networks (https://www.mosonetworks.com/) Private 5G networks, with additional RedCap adapters

Nextivity (https://nextivityinc.com/) Private cellular focused on public safety

Neutral Wireless (https://www.neutralwireless.com/) Broadcasting-focused 5G private network in-a-box

Obvios (https://obvios.eu/en) Private 5G-in-a-box

Star Solutions (https://www.starsolutions.com/?doing_wp_cron=1750195635.1168999671936035156250) Agricultural & rural private network provider

SOLiD Technologies (https://solid.com/open-ran/) Public safety cellular & DAS technology provider

SRS Solutions (https://srs.io/private-5g-networks/) Private 5G provider

SEMPRE (https://www.sempre.ai/news) AI & edge-focused cellular provider

Telrad (https://telrad.com/#) 4G LTE private network and radio provider

Ubiik (https://www.ubiik.com/) Private LTE kit for unlicensed 915 MHz

Core Software Startups

AsiaInfo (https://www.asiainfo.com/en_us/product_system.html) – Lightweight core software startup
AttoCore (https://www.attocore.com/products/) - LTE/5G core software
Cumucore (https://cumucore.com/wireless-tsn-over-5g/) – industrial 5G mobile core software
Druid Software (https://druidsoftware.com/) 4G/5G mobile core software
Node-H (https://node-h.com/en/index.php) private 4G & 5G software
Pente Networks (https://pentenetworks.com/) Mobile core and orchestration startup

Private Network Video Infrastructure

Hytec Inter (https://hytec.co.jp/eng/product/ulc) specialist providing private network connectivity for video monitoring

Private 5G Orchestration

Neutroon Technologies (https://www.neutroon.com/) Network management platform for 5G private networks

Source: Dan Jones, Fierce Network

About the author:

Stephen M. Saunders MBE, Chief Satirist, FNTV

Before there was the Internet, there was Steve Saunders and his trusty #2 HB pencil of note-taking.

Steve began his career in the publishing industry as a van boy—literally, a boy riding on a van—delivering the BBC's Radio Times TV guide through the blood spatters, broken glass, and discarded needles of 1982 East London. His career then took a lateral turn, with stints as a maintenance porter at Harrods and working in the post room of McGraw-Hill's London headquarters in Mayfair, before he was propelled into the savage world of trade publishing as an Editorial Assistant for Data Communications Magazine, covering the cutting edge of fax machines, X.25 packet switching, and V.32bis analog modems.

In 1992, Steve moved to the US—when it was still cool—and as the rest of the Data Comm staff were fired, imprisoned, or retired, in 2000, he finally celebrated the dawn of a new millennium with a promotion to Executive Editor just as the magazine was permanently shuttered.

He then founded the online news organ Light Reading, sold it, repurchased it, sold it again, and has since done various other odd jobs around the communications industry—including starting the New IP Agency (NIA), which one ITU executive described as "a spectacularly ill-advised folly, guaranteed to fail." (It did).

In a career that has taken him from the Front Line of Dalston to Goma in the DRC, Steve has been charged by a Silverback Mountain Gorilla; narrowly escaped kidnapping by the Pakistani Taliban; stood on Broadway watching Tower 2 fall; briefly interviewed Bill Gates; been sued by a hyperscaler (declared a tie); and generally been an insufferable thorn in the side of the industry, for which he was awarded a medal by Queen Elizabeth II in 2018.

Steve is the author of four books and three children: Harrison, Spenser, and Parker. He lives in both the US and the UK, but honestly, Iceland is looking pretty good right now.