

5G & ENTERPRISE

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5G IS WELL & TRULY HERE

When 5G launched in the UK, the Mobile Network Operators faced a couple of big risk factors:

1) There was no obvious need for 5G – 4G (still being rolled out) would do pretty much everything a customer might want (where they could get it)

2) Brexit (implications for consumer confidence, supply chains & East European labour for the civil works).

3) Climate Change (the existential crisis of our times)

Meanwhile 5G is still devoid of a USP & (just 2 months away now) we still have no Brexit certainty.

Since then, 3 more big risk factors have been added:

1) High Risk Vendors –

- requiring extensive Huawei deployments be replaced (so diverting capex from coverage)
- creating a vendor duopoly for highest value elements of a 5G network
- cutting UK business off from Huawei's extensive learnings from China (where Industry 4.0 is actually in progress)
- exposed the risk around 5G resilience

2) Covid-19

3) 5G conspiracy theories/ICNIRP.



Covid-19 has had tragic consequences. But one silver lining is an unprecedented engagement with and deployment of technology in our businesses.

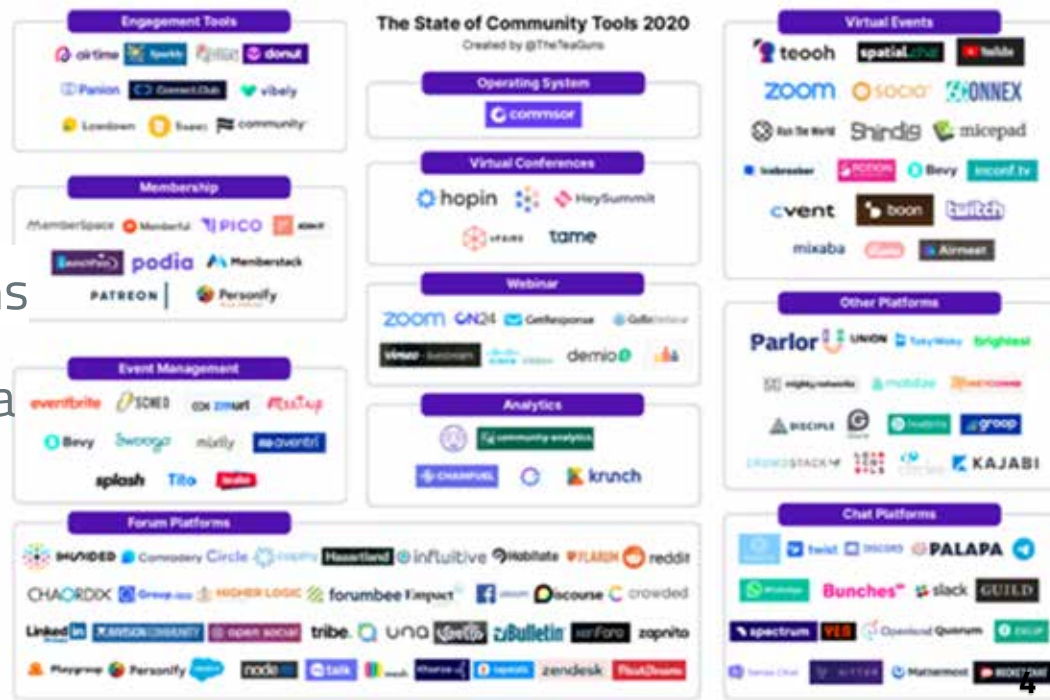
This presents us with one of those inflection point opportunities to utilise a shock for economic renewal. Many firms have experimented with greater digitisation and want to do more - *Sir Charlie Mayfield, Chairman, Be the Business*

THE ZOOM BOOM

Connectivity implications:

Minimum bandwidth for Zoom group calls only c1.8 Mbps, & latency can be as high as 150ms

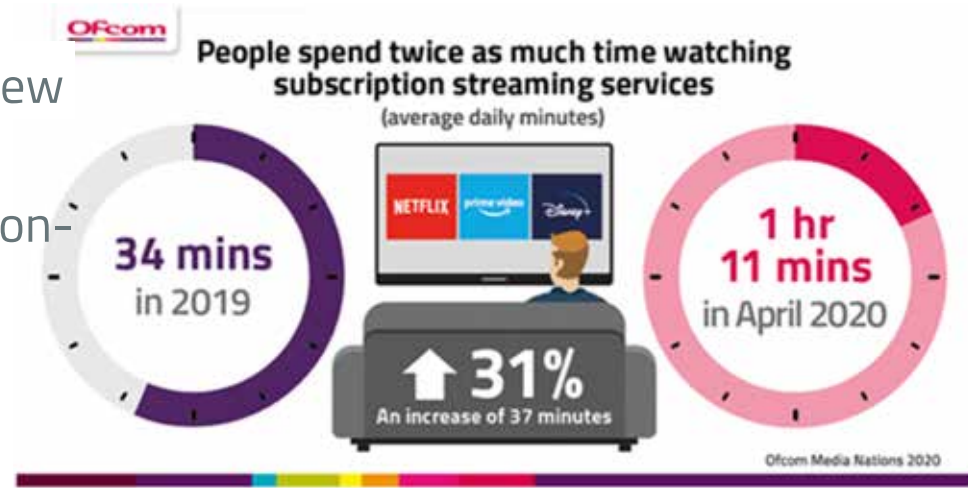
So although those exposed on a group call as having very slow broadband may trade up a tier, Zoom won't be driving fibre or 5G adoption.



BROADCAST SUBSTITUTION BY IP ACCELERATED

c12 million people signed up to a new video streaming service during lockdown. After, uplift in viewing non-broadcast held steady, while broadcast TV viewing declined.

Connectivity implications:
c5 Mbps for HD, up to 25Mbps for UHD, with latency <100ms. Again, no need for fibre or 5G.



Source: MTM

	% Share of new GB SVoD Subscribers	
	3 m/e April 2020	3 m/e June 2020
Amazon Prime Video	12.9%	45.1%
Disney+	52.1%	21.8%
Netflix	19.4%	11.7%
Now TV	6.2%	5.0%

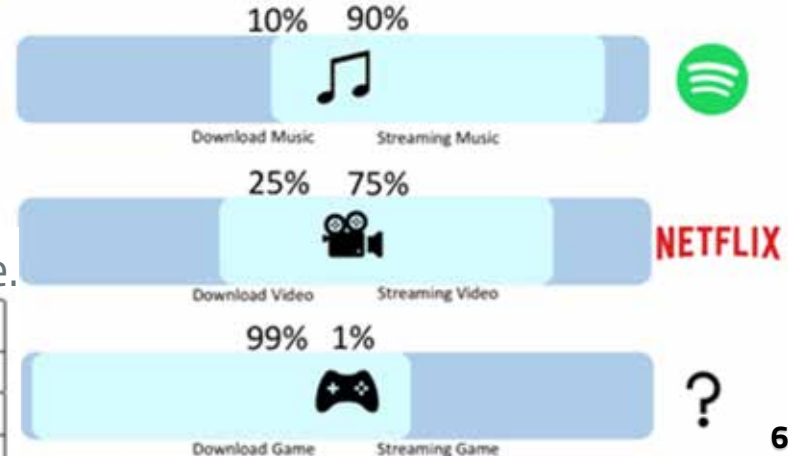
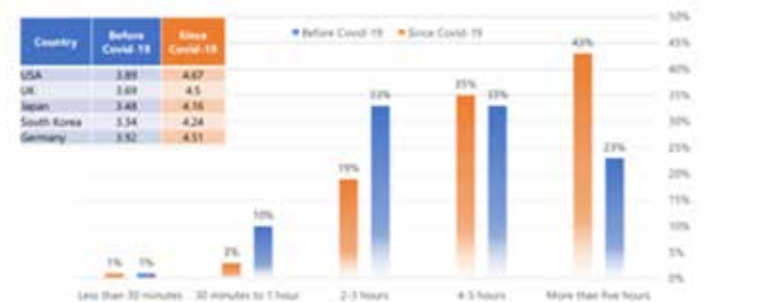
GAMING

Video games are big business, with 2.5 billion gamers & 2019 \$152bn worldwide revenue.

Ipsos Mori's GameTrack noted a lockdown acceleration in the shift to digital, plus greater emphasis on social interactions & creative aspects. Increasing interest in cloud gaming.

Hardcore gamers will pay for a consistent connection, potentialv higher reliability of fibre.

Hardcore Gamers More Active



CG	Frame Rate (FPS)	Coding	Data Rate (Mbps)	Latency* (ms)
2K (2560 x 1440)	70	H.264	30 - 50	≤ 20
4K (3840 x 1920)	90	H.265	50 - 200	≤ 16
8K (7680 x 3840)	120	H.266	200 - 800	≤ 10

WFH: NETWORKS COPED

Despite government concerns, fixed and mobile networks proved to be up to the job of a sudden switch to mass WFH, coping with network usage, including considerable data driven by new games upgrades.

5G followed the traditional mobile deployment playbook, rolled out to urban centres - Covid decimated traffic. Mobile devices switched to connecting over domestic Wi-Fi

The coronavirus

But Covid-19 has shifted assumptions about what we need to equip ourselves for the future, especially as demands for greater localism in decision-making are increasing.



Source: Understanding Society Covid-19 Study

CONSUMER CONFIDENCE GRADUALLY RETURNING

Consumer confidence impacts:

- take-up of 5G handsets, thus:
- Investment in public networks (many businesses will only seek to adopt 5G from a public network plus, as with Cloud, hybrid is an option);
- general confidence in 5G (influences enterprise confidence in 5G)
- demand for goods & services (and so, enterprise demand for technology upgrades).



5G's PROMISE

Pre-launch hype focussed on use cases which are years away.

Now 5G needs to quickly identify problems to profitably solve.

UK5G-authored review urged DCMS to re-focus 5G testbeds from research and innovation to identifying sustainable uses.



Image credit: NEC

5G'S "JETSONS" FUTURE REMAINS A WAY OFF

Remote robotic surgery

Other than for emergencies, unlikely to be the first choice for surgeon or patient.

Years away

Untethered VR

For consumers, costly, games-focussed.

For enterprise, gaining traction in training.

Early days

Autonomous vehicles

Taking a while to arrive.

Trials in US suburbs of limited applicability to EU roads.

Will never rely on public networks



5G's REALITY

5G sells speed to consumers.

- Devoid of a killer app;
- with only limited availability (yes, even on EE); &
- only available on high-end smartphones.

5G's marketing sells on downloading movies & future-proofing.



HOW FAST (IF YOU MUST KNOW)?

But isn't 4G fast enough for almost any use case (where you can reliably get it)?

Research repeatedly shows consumer preference for coverage over speed.

How Fast Is 5G?

Average 4G and 5G download speeds in selected countries (in Mbps)*



* Data collected between July 1 and September 28, 2020
Source: Open Signal



5G HAS A TOUGH BUSINESS CASE

MNOs must rapidly build out dense, low-latency edge networks in ways that are affordable, secure, and easily maintainable.

These new networks are dense and complex, with potentially high operating & maintenance costs.

New & revolutionary use cases require costly network changes in architecture & operation:

Moving to cloud native infrastructures, redefining network edge, enabling automated network slicing & integrating security everywhere.

Latency requirements & network load produce strain on the RAN.

Network density drives switching & associated traffic management.

MIMO & “beamforming” require edge compute power.

5G's VALUE ADDS ALWAYS LAY WITH ENTERPRISE

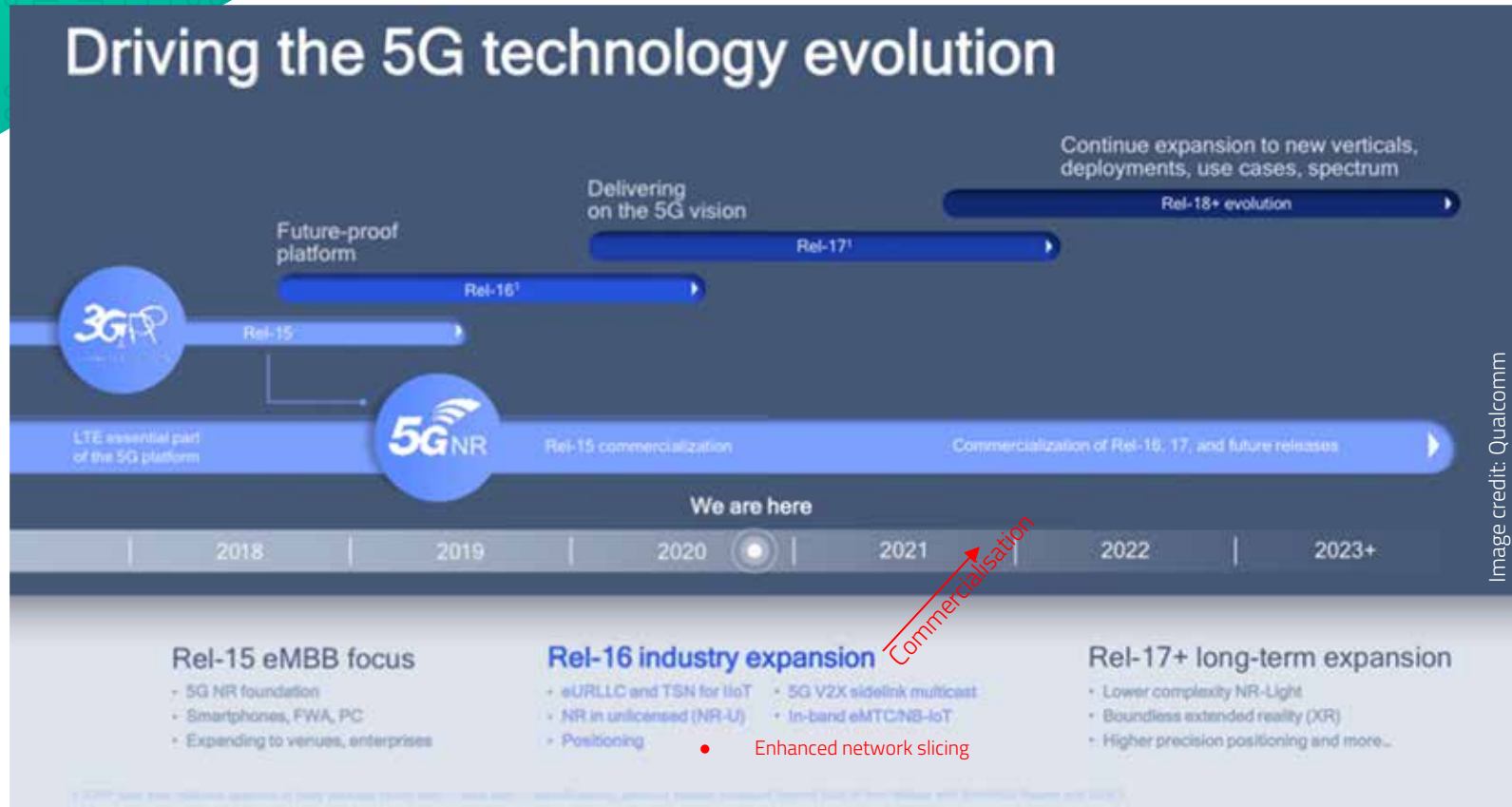
How many consumer use cases might even need this element?

5G's ENTERPRISE-FUELLED ECONOMIC VALUE

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Public services in
the UK

BELLS & WHISTLES FOR ENTERPRISE LARGELY YET TO ARRIVE



ENTERPRISE USE CASES FOR 5G's BELLS & WHISTLES

Vertical Business Cluster & Addressable UseCase

External factors in capex decisions








Partially Public services & regulated

Public services

Heavily regulated

Partially Public services & regulated

Heavily regulated

Vertical Business Cluster		UseCase
	Manufacturing – Industry 4.0	Collaborative Robots, AR/VR for Maintenance, Remote Monitoring, Digital Twins, Asset Tracking...
	Public & Private Safety , Security	BodyCam Wearable, Smart Surveillance, Face Recognition, People Counting ...
	Smart City - Smart Area	Smart Parking, Smart Lighting, Water Metering, infrastructure monitoring, Cognitive Environment, ...
	Energy & Utilities	Smart Locking, Pylons monitoring, Drone Data Visualization...
	Tourism, Culture, Entertainment	Immersive museum visit (AR/VR), Video360, Streaming
	Mobility & Road Safety	Connected bus, Autonom. Guided Vehicle, Object Detection for road safety
	eHealth	Remote Support (Augmented Reality), ...

REAPING 5G's POTENTIAL MEANS ADDRESSING BARRIERS

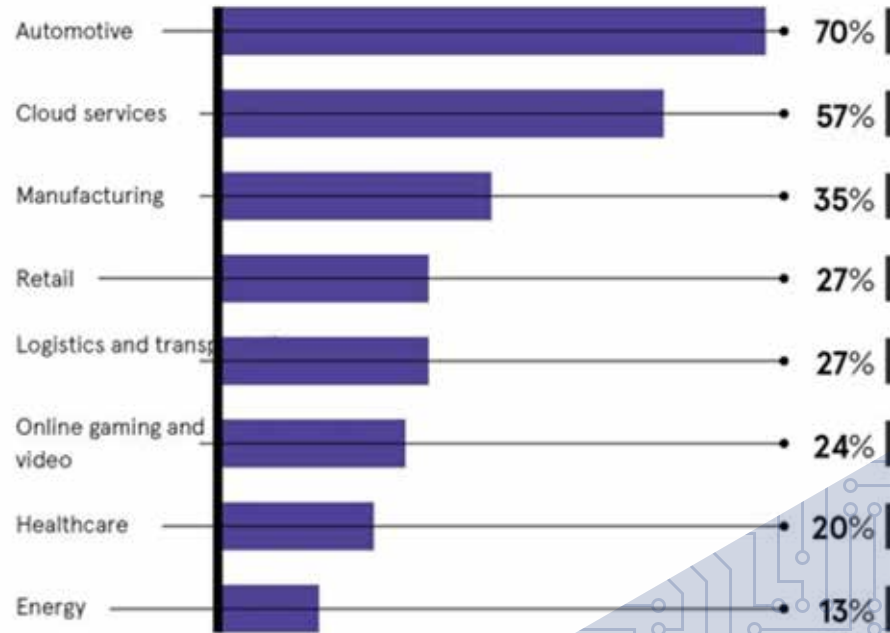
Enterprise focus on solutions to problems, often with long adoption curves. Want incremental improvements to existing processes, with minimal disruption & retraining. Evolution, not revolution.

Regulatory approvals & political lens.

SMEs have specific barriers.

WHERE WILL 5G HAVE THE BIGGEST IMPACT?

Top industries where 5G will cause the most disruption, according to global IT leaders and service providers



SMEs HAVE SPECIFIC BARRIERS

Almost 70% of people employed in the UK work in low-productivity businesses.

Majority of these are SMEs that lack resources and capacity to adopt technology at scale.

98% of UK manufacturers are SMEs.

SMEs have different pain points - access to information, resources, markets, finance, & training. Vendors often don't market to SMEs, who often don't look for products as the market defines them.

Often no IT team.
Solutions need to come in a box - not bespoke.

SMEs are in financial distress, with 40% stating they will likely be out of business by the end of the year if current economic conditions continue (source: Be The Business)

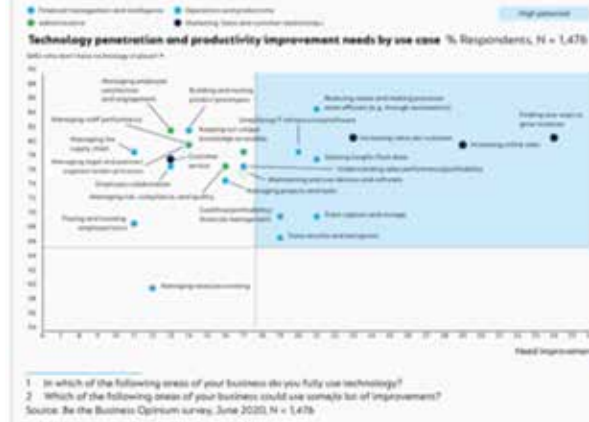
SMEs HAVE SPECIFIC BARRIERS

"As they seek ways to remain in business and increase resilience as they adapt to the new normal, they have become highly motivated to implement technology" - The UK's Technology Moment , Be The Business, September 2020

But access to trusted information is key.

Targeted public intervention could reap huge rewards,

Marketing & sales cases need most improvement and have low tech penetration



There is **low tech penetration (16-20% vs. 25% on avg.)** in the use cases where SMEs see most opportunity for improvement

Though data security is a major concern for SMEs (61%) and data related use cases are high improvement areas, sharing sensitive business data is not one of the top barriers to adoption

The three most important decision factors for SMEs are also areas of least satisfaction



At least **60%**

of the SME market considers each decision factor as important - suggesting that solutions must be at least satisfactory across all factors

This combination of high importance and dissatisfaction could be driving the high adoption rates of B2C solutions amongst SMEs, which they cite as easier to implement and more user friendly

5G's CURRENT OBSESSION: PRIVATE ENTERPRISE NETWORKS

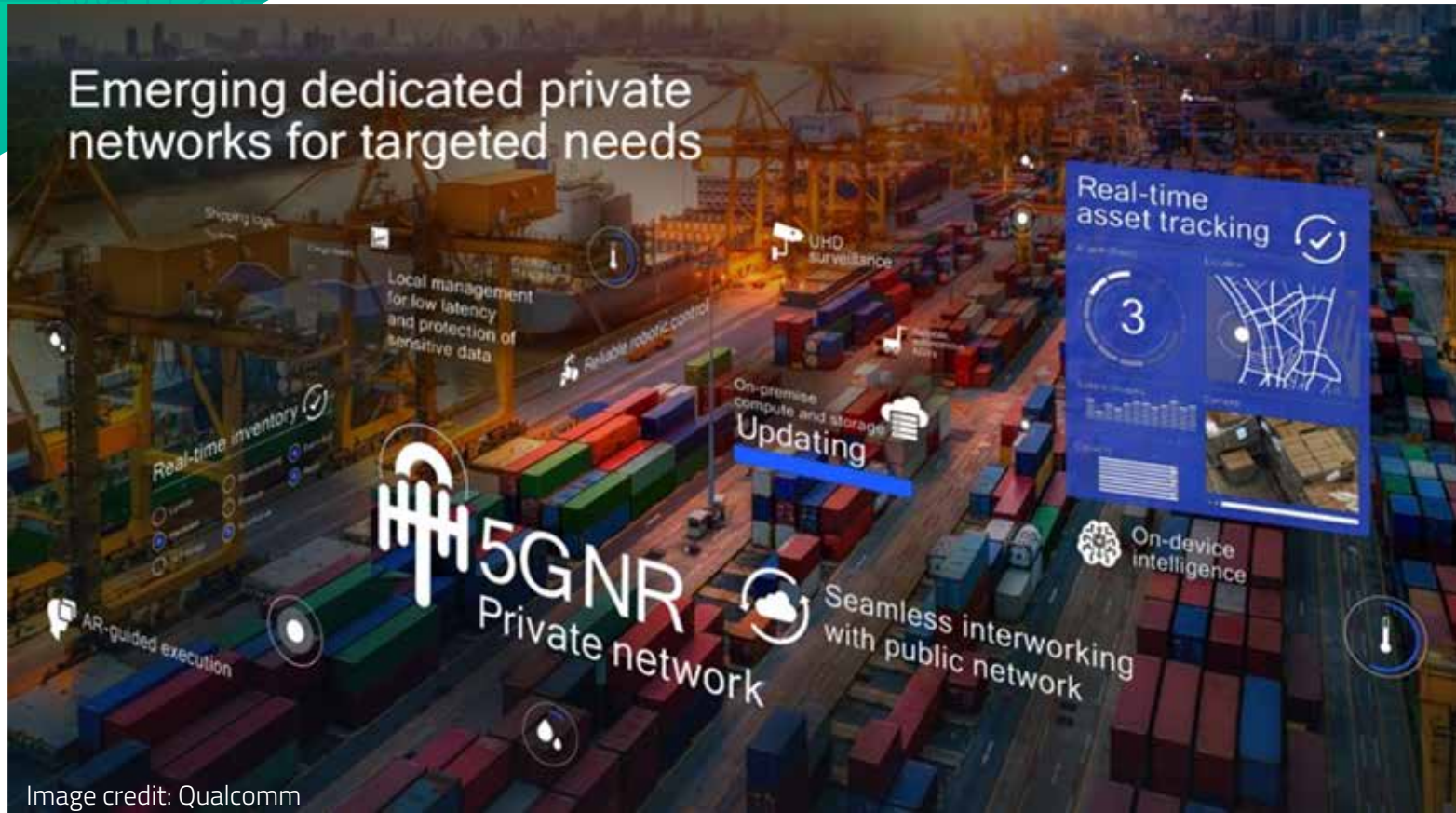


Image credit: Qualcomm

PRIVATE ENTERPRISE NETWORKS: WHY & WHO?

Why?

Greater control.

Security.

Reliability (SLAs).

Network configured for local use cases. Coverage where needed.

Higher upload capacity.

Faster fail over.

MNO provision

Long experience of running "carrier grade" networks inc. 24/7 NOC

Deep understanding of the technology (hardware & software) & vendors.

But do they have the sales channels?

Or key Suppliers/SIs

Understand customer's pain points, culture, risk appetite.

But no experience of designing, installing & running cellular.

SIs don't always deliver the future-proofed solutions.

CONCLUSIONS

Covid-induced digital transformation has brought forward enterprise interest in 5G, although key features are a few years (and considerable investment) away.

Enterprise requirements for 5G are more likely to be evolutionary, not revolutionary.

SMEs need special attention, potentially supported with public intervention.



THANKS!

Any questions?

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