

The 5G Myth:

*And why consistent connectivity is a
better future*

By William Webb

9 How the future plays out

9.1 *Why 5G as currently envisaged is flawed*

The key underlying rationale for previous generations and for 5G has been to meet ever-growing user requirements for more data and faster connectivity. Chapter 2 suggested that this trend is coming to an end. Current mobile data speeds are more than adequate for all foreseeable uses. Data growth is slowing and may plateau around 2027, with only around 2x growth occurring during the 5G era. With 5G predicated predominantly on higher speeds and also on its ability to deliver substantially enhanced data capabilities, this suggests 5G may not be targeting the right areas.

Chapter 3 showed how technology has improved dramatically over previous generations but has now reached a point where further improvements are hard-won. This broadly means network enhancements become expensive in the form of many more antennas at the base station and in the device, many more small cells, or dense deployments in completely new frequency bands. All of these are uncertain, some untried, and some will require substantial further development. The advent of 4G effectively provided a capacity enhancement of around 2.5x at very little extra cost. The same will not happen for 5G. Relatively low-cost capacity enhancements will likely provide less than 2x improvements. Going beyond this will come at a very high cost due to the very large number of additional small cells that will need to be deployed.

Chapter 4 has shown that the economics of the mobile industry have changed substantially over the decades. From a time during 2G when the MNOs were some of the most profitable listed companies they have fallen to the point where they are underperforming the “all sector” benchmarks by some 50%. Revenues are not expected to rise while investment is anticipated to continue at relatively high levels. The only rationale for MNOs to invest in new technology is to prevent subscriber churn to their competitors. This threat has resulted in them moving quickly to deploy 4G, which does have material benefits for subscribers. But without any clear benefits from 5G there is limited incentive for MNOs to upgrade their network.

Chapter 5 has shown that it is in the interests of all the key players to be supportive or even strong promoters of 5G. Academics benefit from 5G initiatives as sources of funding. Manufacturers rely on the roll-out of 5G to provide a boost in revenues. Operators fear if they step out of line they will suffer competitive disadvantage. Governments see political benefit in being supportive. It is in nobody's interest to rock the boat.

The 5G community cannot be accused of being short of visions, quite the converse. Chapter 6 sets out visions which range from metrics for the radio system to a wide breadth of use cases. It feels somewhat that 5G is intended to solve all the problems of the mobile community and provide a utopian solution where all have perfect communications that meets every need that they might have. This compares with previous generations where the visions have been much more restricted such as improving capacity, or providing a specific data rate.

But the visions are too utopian. Achieving them would require astonishing break-throughs in radio technology and for subscribers to be prepared to significantly increase their spending. Both are heroic assumptions. In practice, most visions can be adequately achieved with existing technology such as evolved 4G, evolving Wi-Fi and emerging IoT technologies.

The future is uncertain, and requirements or services may well emerge that result in a different industry than seen today. But until that happens, 5G investment cannot be justified.

9.2 Consistent connectivity - a better future

Chapter 7 has set out how speed of data connection is now becoming less important than consistency – the ability to be connected at a reasonable speed everywhere. Rather than aiming for ever-faster connections it suggests that delivering enhanced coverage in a number of known problematic locations such as trains and rural areas would generate greater value for the economy and be preferred by most consumers.

In most of these locations Wi-Fi is a better solution than cellular, with the exception of coverage in rural areas. This reflects a trend that has been underway for years towards increasing use and reliance on Wi-Fi to the extent that it is now the preferred method of communication for most. Developing policies for a “Wi-Fi first” world is becoming increasingly important for Governments and regulators.

The end result – connectivity everywhere – would be one well worth striving for. A great road system is no longer one with unlimited maximum speed, but one with minimal congestion and excellent safety. A great communications system is one available everywhere, all the time with minimal congestion and at low cost. If the focus of 5G could be switched toward this direction that would provide a new generation worth having.

Chapter 8 has shown that regulatory forces and governmental policy also have an impact on the mobile sector and hence on the form and timing of the introduction of 5G. While regulators profess a strong desire to promote innovation and new technologies, in practice their focus on competition is likely to undermine the ability of MNOs to find innovative solutions to the problem of financing 5G deployments. A better regulatory approach would be to allow mergers, deployment of shared networks and the emergence of various OTT and MNVO-like models. But given the impression from the industry that 5G is thriving and imminent it is unsurprising that regulators see no need to change their current positions – indeed they might conclude that these positions are helping to speed 5G implementation. The net effect will be unhelpful but this will only become apparent over the next few years.

The chapter also considered whether 5G might have a role to play in broadband fixed wireless access (FWA). Some US companies believe that it does, and the particular economics of the US may favour it there, but the history of FWA is bleak and there is little in 5G that would seem to change the underlying dynamics.

9.3 Significant industry structural change

The analysis of 5G has shown that the mobile industry is in relatively poor shape. Revenues are static and profitability poor relative to other sectors. Regulation is backward-looking and not favourable towards innovation or structural change. Coverage is not improving materially and some areas, such as trains, remain with poor coverage over 30 years after the introduction of 2G. Other forces such as the growth of Wi-Fi are emerging.

It could be that 5G becomes a catalyst for industry change. Indeed, it might be that there is no new 5G technology but the inability to introduce it allows for debate and change in the industry. In debates [1] over 80% of delegates expected that the 2020s would see very significant structural change in the industry, although there was less clarity about what these might be. Many realise that something has to give.

Earlier chapters have hinted at what this structural change might look like. These include:

- The boundary between MNOs and OTT providers shifting, with OTT providers taking on more of the functions of the core network.
- The radio access network (RAN) consolidating to 1 or 2 providers, with single shared networks in hard-to-cover areas.
- Wi-Fi playing a wider role, with simplified access to millions of access points per country.
- Alternative communications providers emerging, offering service across the RAN networks and Wi-Fi, coupled with other services such as the Google suite of mobile products.

This would lead to a dramatic shift in power within the industry:

- Manufacturers such as Ericsson and Nokia would suffer as the number of RANs declined and there was no new technology. Some will cease to exist in their current form.

- Conversely, manufacturers such as Cisco will benefit as the core elements become more important and are duplicated across multiple parties.
- MNOs may merge as the number of RANs drops. They will have falling consumer presence as MVNOs enter the market.
- OTT providers and new entrants will benefit by gaining subscribers.
- The Wi-Fi community will benefit as Wi-Fi becomes an ever more important part of the national infrastructure.

This would be a significant shift, and one that has the potential to restore the industry to profitability. It would facilitate a raft of innovation, changing our communications landscape beyond recognition.

It may transpire that 5G is not a new technology or set of services but a catalyst for industry change after years of gradual decline.

9.4 5G becomes whatever new stuff happens

After all of this discussion is it any clearer what 5G is?

This book has shown that 5G cannot be what is currently claimed. The visions set out by the key players are unrealisable and the technology to deliver a new generation has not materialised. 5G as currently proposed is a myth.

One possible outcome is that it takes the industry many years to realise this. MNOs deploy some 5G elements such as mmWave city centre systems and ultra-low latency solutions only to discover that there are few services that require them. Investment slows and promotion of the new capabilities disappears. The 5G deployments would be increasingly mothballed and the industry would come to recall the experience as an expensive mistake. This outcome is most likely in the Asia-Pacific area where MNOs have stronger balance sheets and where there is a powerful culture of aiming to be at the forefront of new technology. This can be seen in the desire of Korea Telecom to have a 5G solution at the 2018 Winter Olympics and the push from operators in Japan and elsewhere to lead in 5G. It is less likely in Europe where MNOs are

under severe investment constraints, and unlikely in the US where MNOs are more pragmatic and less visionary.

A second possible outcome is that there is no real 5G deployment, but industry saves face by claiming that 4G systems currently being implemented are really 5G. There are already signs, for example, that some manufacturers are proposing that the implementation of NB-IoT coupled with a virtualised core would comprise a 5G solution. These developments are very much 4G solutions, implemented now on current 4G networks but 5G is ultimately just a name. Anyone can, and will, claim that they have a 5G network even if they have just implemented the latest 4G upgrade. **Some have suggested that 5G will be whatever interesting developments happen from 2018 onwards.**

This makes some sense. There is much political capital expended in claiming that 5G will be deployed early in a country. MNOs and Governments will simply claim from 2018 onwards that they have 5G even though all that has been deployed is evolved 4G. For all the debate, 5G could be a label, not a technology. End users will be told that they now have 5G even though they have not changed their handsets nor received any improvements in service. Or alternatively, in the case where 5G is the label applied to the introduction of IoT, consumers may be told that 5G is not about their handset but about the ability to connect their devices. In the US, the term 5G might be applied to FWA deployments, with “5G to the home” competing with FTTH. Given the confusion around what 5G is, this second “label whatever we have as 5G” approach could be used in Europe and the US alongside the first “limited mmWave deployment” approach happening in Asia Pacific.

But simply labelling current developments as 5G is an opportunity lost. As set out in Chapter 7 there is much change that both benefits consumers and leads to a more sustainable structure for the industry. If Governments, regulators and MNOs stopped competing on having the fastest solutions in the world and re-focused on consistent connectivity then 5G could be a strong force for good.

9.5 *The future is bright – once the vision is realigned*

This book has been predominantly critical of the current direction for the mobile communications industry and in particular the vision of 5G as portrayed by key players. But the book has not been negative about the potential future benefits of mobile communications. Delivery of IoT nationwide would be transformational and one of the greatest achievements of the industry for decades. Delivery of consistent connectivity would be appreciated by almost all mobile phone and Internet users. Collectively these would be more than a new generation – effectively a new era in wireless – and they can be readily achieved with appropriate focus. In doing so, many of the problems that ail the industry can be addressed. All we need is a little realignment. The aim of this book is to stimulate debate that allows 5G to become whatever good things happen from 2018 onwards. After all, it's good to talk, and the future could be bright....

References

[1] See

<http://www.cambridgewireless.co.uk/crmapp/EventResource.aspx?objid=60851>

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William is a Director at Webb Search Consulting, a company specialising in providing the highest level of advice in matters associated with wireless technology and regulatory matters. He is also CEO of the Weightless SIG, the standards body developing a new global M2M technology. He was President of the IET – Europe’s largest Professional Engineering body during 14/15.

He was one of the founding directors of Neul, a company developing machine-to-machine technologies and networks, which was formed at the start of 2011 and subsequently sold to Huawei in 2014 for \$25m. Prior to this William was a Director at Ofcom where he managed a team providing technical advice and performing research across all areas of Ofcom’s regulatory remit. He also led some of the major reviews conducted by Ofcom including the Spectrum Framework Review, the development of Spectrum Usage Rights and most recently cognitive or white space policy. Previously, William worked for a range of communications consultancies in the UK in the fields of hardware design, computer simulation, propagation modelling, spectrum management and strategy development. William also spent three years providing strategic management across Motorola’s entire communications portfolio, based in Chicago.



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