

## Faster downloads to haptic e-commerce: the consumer benefits of 5G

- 5G network applications will bring benefits to consumers as the standards evolve.
- The future is not just the metaverse, but a range of inclusive applications
- Policy makers need to recognise that 5G is a process not an event and facilitate their commercial development

Ofcom's discussion paper on its future approach to mobile markets<sup>i</sup> recognises that mobile services will become even more important in the coming years. It expects to see a significant growth in mobile data usage driven by applications that take advantage of 5G, in particular by businesses. The benefits for business customers have been widely discussed, but it is important that regulators do not ignore the benefits of 5G for residential consumers.

This edition of Hexagon describes some emerging 5G consumer use-cases and the benefits they could bring. It also considers how regulation can be implemented to help those benefits be realised<sup>ii</sup>.

Much has already been written about how 5G communications technology will benefit business customers: for example, supporting manufacturing and logistics, campus networks and crowd management.

The many benefits that consumers will derive from 5G should not be ignored. These benefits may not be there on the first day 5G networks are built but, our research shows, are likely to develop over time.

Listening to some commentators, one might think that 5G is a single event, resulting in an overnight communications revolution. However, this perception is incorrect. Each of the generations of mobile communications consists of various "Releases" issued by 3GPP<sup>iii</sup>, the standards setting authority. Each previous generation of mobile communications has consisted of four or five Releases, with the full power of the generation not available until the last Release. The same process will repeat itself with 5G.

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*5G is not an event, but a process during which new and unpredictable consumers use-cases will evolve*

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Applications and benefits will evolve over time as the process unfolds, although even now some of these are visible. We can look at use cases evolving over the short, medium and long term: what Ericsson refers to as business ready; showcase level and R&D level<sup>iv</sup>.

5G applications that are already in the market, and so "business ready", obviously tend to be closest to 4G services in what they offer consumers. These



applications take advantage of the “enhanced Mobile Broadband” (eMBB) features of 5G, and often are simply based on higher speed access. Showcase and R&D level applications will build on eMBB, but also exploit the other new, inherent features of the International Telecoms Union’s (ITU) 5G standard: Ultra Reliable Low Latency (URLL) and Massive Machine Type Communications (MMTC) features<sup>v</sup>.

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*Many examples of applications show how consumers will benefit from 5G as it evolves.*

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The obvious example of a business ready application is faster downloads, offering an improved experience for consumers. The ITU’s 5G specification targets a peak data rate of 20 Gbit/s and a user experienced rate of 100 Mbit/s, respectively 20 and 10 times the targets for 4G. With such improved speeds, an average length movie can be downloaded in a little over seven minutes, compared with 49 minutes on 4G<sup>vi</sup>.

With these improvements, it is perhaps not surprising that Ericsson found networks in some

countries using 5G as a substitute for fixed wireless access.

A more interesting example of a business ready application is a “Best Seat Experience” that allows users to watch a sports or other event as if they were in the venue.

An example of the benefits of best seat event experience is provided by EE at the FA cup final in 2019 between Manchester City and Watford<sup>vii</sup>. Fans of the two teams who could not attend the event were able to enjoy a richer experience than they would on linear broadcast TV. Amongst other things, they could be “near” to friends and family at the match, zoom in on sections of the pitch and even virtually walk through the tunnel with the players on to the pitch.

Moving to showcase level applications, social media is moving towards Augmented Reality (AR), designed to make existing social media more authentic and lifelike. Although perhaps most targetted at young demographic groups, AR social media is also likely to be attractive to older age groups who relied on social media during the Coronavirus pandemic to maintain contact with friends and family.

Slightly behind AR social media is the Metaverse, currently at the R&D stage of development. If the excitement about this development translates into reality, it will have significant and unforeseeable consumer benefits, in particular providing users with a virtual space to take part in activities they would normally do in the real world.

A final example, also at the R&D stage, is the haptic internet that allows users to experience physical sensations across the internet. Vodafone demonstrates this using a virtual rugby tackle. A player “tackles” a cylinder containing various sensors that pick up the force, location and direction of the tackle in one location and transmits that to a player somewhere else, who responds as if tackled in reality.

More commercial consumer use-cases of this technology are haptic shopping, where the shopper can feel the goods he or she is buying on-line, and haptic devices for blind and partially sighted people that can, for example, guide users to their seats in stadiums and theatres.

Whether these examples of consumer use-cases become commercial success stories, the “killer apps” of 5G, cannot be predicted. However, a look



back shows how much new mobile network generations can change consumers' use of the internet.

Until 2009, when the first Release of 4G became commercial, sales of smartphones that were reliant on WiFi for connectivity were low: just 140 million. By 2015 sales had increased ten-fold to 1.4 billion per annum and the number of active app on Apple's app store increased from just 500 to 1.85 million, with a similar increase on Play Store.

Could we have forecast the massive growth in apps that run our daily lives as consumers just thirteen years ago?

As we look forward, is there any reason to expect we will not see a similar growth of consumer-based apps on 5G, such as those described above, that are likely to require the full feature set of 5G: eMBB, URLL and MMTC? Is there a realistically conceivable version of the future that does not include a massive increase in the consumption of data?

It is our view that the answer to both these questions is "no". We see no reason not to expect a growth in consumer services that require 5G's

features and, like Ofcom, no reason not to expect a massive growth in data.

What does this mean for regulators and policy makers when considering the future of mobile communications? We suggest three things:

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### *Three actions for policy makers and regulators.*

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First, policy makers need to recognise that 5G is a process not an event. They should not expect the benefits for consumers to be available on day one. Instead, they need to accept that it will take time for these benefits to emerge as new 3GPP Releases are adopted, appropriate access devices are available and consumers adopt new apps.

Secondly, the 5G business case is more challenging than it was for 4G, which was the first mobile standard to be developed specifically for data, using packet, rather than circuit, switching. The 4G business case was built primarily on an improved mobile broadband experience.

As the 5G standard develops, applications using URLLC and MMTC are likely to be transformational

for users but more difficult to predict making the business case for 5G riskier. Policy makers should be aware of this and not take actions that increase risks for investors.

Thirdly, the mobile ecosystem may well evolve under 5G making the current ecosystem unrecognisable. Again, regulators and policy makers should not take actions that assume a specific ecosystem is the natural outcome. Instead, they should let the system develop to reflect the commercial realities of the market, on both the demand and supply side.

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<sup>i</sup> 'Ofcom's future approach to mobile markets: A discussion paper' 9<sup>th</sup> February 2022

<sup>ii</sup> This edition of Hexagon is based on a report commissioned from SPC Network by Vodafone UK. All views and opinions expressed here are those of SPC Network.

<sup>iii</sup> [www.3gpp.org](http://www.3gpp.org)

<sup>iv</sup> Ericsson (2021) *Five ways to better 5G*

<sup>v</sup> ITU (2015) *Recommendation ITU-R M.2083-0*

<sup>vi</sup> [letstalk.com/cellphones/guides/5g-vs-4g/](http://letstalk.com/cellphones/guides/5g-vs-4g/)

<sup>vii</sup> A short video can be viewed here <https://vimeo.com/340870583>.

