



The *Mobile World Congress Americas (MWCA)* took place in Los Angeles from Sep 12-14, 2018. This is the second year that GSMA and CTIA have partnered to put this show together. And, for the first time, it has found a home in Los Angeles. The convergence of telecom and media that had already started is expected to accelerate with 5G networks enabling massive bandwidth to carry high-fidelity content for consumers and enterprises. Los Angeles, the cradle of premium content, is an excellent locale to watch that trend play out. About 22,000 people attended the show. LA will also be a compelling showcase for all kinds of assisted driving and traffic management, as Los Angeles drivers spend over 100 hours a year in traffic. With the 2028 Olympics as the backdrop, LA's goal is to become a global model city for autonomous movement. Global mobile operator revenues are expected to grow from \$1.05T in 2017 to \$1.10T by 2025, growing at about 1% a year.

5G: US Taking the Lead

By 2025, almost half – 49% - of mobile connections in North America (US and Canada), will be on 5G, versus 15% of global mobile connections.

Verizon is launching a commercial 5G fixed wireless service, called 5G Home, in several cities including: Houston, Indianapolis, Los Angeles, and Sacramento in October. The company will be using its own 5GTF specification first at 28GHz frequency, before deploying mobile 5G using the 3GPP 5G NR standard in early 2019. The service promises speeds of 300-940 Mbps for \$50/month for Verizon subscribers and \$70/month for others. While 5G is considered a threat to cable operators, Charter CEO Tom Rutledge told CNBC that his company is in a better position to deploy 5G than the cellular industry, and warned about high-capacity wireline connectivity to small cells required to deploy 5G. Charter plans to offer 1Gbps cable service to the home using DOCSIS 3.1 technology by end of this year. Exciting space to watch!

AT&T plans to roll out mobile 5G service in US, based on 3GPP 5G NR specs on millimeter wave frequencies, in 12 cities by end of this year and an additional seven cities in early 2019.

Sprint plans to deploy mobile 5G on 2.5GHz in first half of 2019. Sprint's former CEO and current executive chairman, Marcelo Claure, is strongly pushing for Sprint's merger with T-Mobile US, arguing that the combined company will be well positioned to build world's leading 5G network based on its spectrum assets and financial resources. Meanwhile, T-Mobile US COO, Mike Sievert, has told FCC that the proposed merged entity, New T-Mobile, will be able to allocate Sprint's 800 MHz and T-Mobile's 600 and 700 MHz spectrum assets to deploy 5G without degrading LTE experience. It will also be able to offer 5G in-home broadband service to more than half of US, in addition to providing 5G mobile service.

Nokia's CEO, Rajeev Suri, in his keynote, applauded the 5G initiatives of all four Tier-1 US operators that are working to launch 5G earlier than initial industry expectations. And he urged all operators to move out of their comfort zone to unlock value of 5G with new ways of working and new business models. 5G provides operators with hyperlocal presence and tons of data that webscale and OTT players don't have.

5G: Where are the Use Cases?

The initial deployments of 5G are about massive broadband speeds. The 5G fixed wireless access can provide a substitute for traditional cable service to the home, as discussed above. The mobile 5G services can enable consumers to get streaming HD video or virtual reality to their mobile devices. However, the virtual/ immersive reality still lacks good usability for broad adoption. In addition, 5G can also make content production more agile. Content providers, such as Fox Sports, can use mobile cameras to capture sports content in high definition, where it happens rather than installing wired cameras at fixed spots. Sprint CTO, John Saw, sees 5G as one way to disrupt verticals. AT&T, given its recently-acquired content assets in Time Warner and Dish Networks, views 5G as a big enabler of content creation and distribution. In a recent GSMA Intelligence survey of mobile network operator CEO's, about 70% believe enterprise market provides the most important 5G revenue opportunity compared to 23% who believe that for consumer market. Major cloud players are also eyeing the enterprise market.

IoT Driven by Digital Transformation:

Global IoT connections between 2018 to 2025 will almost triple, growing from 9B connections in 2018 to 25B connections in 2025. The consumer IoT portion will be doubling during that period from 5B to 11B connections. The industrial IoT connections, driven by digital transformation, will be almost quadrupling

from 4B connections in 2018 to 14B in 2025. The global IoT revenues during that period will also quadruple from \$267B to \$1.1T. The majority of the value will go to applications, platforms and services. Plain connectivity will be a commodity. Vodafone IoT Barometer report also shows that the number of companies using IoT has more than doubled in the last 5 years, and usages have expanded.

Use of two cellular LPWAN (Low Power Wide Area Network) technologies: LTE-M and NB-IoT is picking up. AT&T will be launching NB-IoT service in Q2 2019. Vodafone is launching an NB-IoT network in UK, adding to its NB-IoT launches in 7 other countries. There are currently 46 NB-IoT networks and 13 LTE-M networks' according to GSMA. Operators need to beef up their LPWAN capabilities to compete with alternatives such as LoRA and Sigfox.

Artificial Intelligence

Azita Arvani talked at Future Digital Healthcare summit about 5G and AI in service of healthcare, stating that 5G and AI are huge force multipliers. This will catapult the digital transformation of many industries, particularly healthcare. Massive broadband, ultra-reliable low latency communications, and tens and hundreds of billions of connected devices along with network slicing will play a big role in enabling AI applications. In turn, AI will play a big role in network automation and network optimization.

Marcelo Claure, Sprint's executive Chair and former CEO, said in a keynote speech that companies that use 5G and AI to disrupt traditional industries "are always going to win". He has a great vantage point due to Softbank's investments into various AI companies.

5G Needs Support from Regulators on Spectrum and Small Cell Siting

5G networks require a wide swath of spectrum to deliver on their vast array of use cases. The good news is that 5G NR (new radio) natively supports all spectrum types: low-band (below 1GHz), mid-band(1-6 GHz) and high-band(above 24GHz). The higher the frequencies, the more throughput and higher speeds but the worse propagation properties become. Mid-band spectrum, such as 2.5GHz, 3.5GHz, and 3.7-4.2Ghz, is considered a sweetspot for 5G. Operators and vendors are urging FCC to open up new mid-band spectrums more quickly. In addition, 5G also requires deployment of many small cells. The average time to acquire small cell siting approval in US is about 18 months. The mobile industry is urging US regulators to streamline the siting process.

Content in Age of 5G

Partnering between content providers and mobile operators can be a great way to showcase capabilities of upcoming 5G networks and drive new revenue streams. This includes immersive content, especially augmented reality, virtual reality and 360 videos.

Consumers are already watching less traditional TV and more videos on mobile. The trend is no longer limited to short user-generated videos for a few minutes, but also long-form premium video. AT&T stated they are seeing great interest from their customers in watching premium content on their mobile devices and hence adding features to its DirecTV Now app to make the user experience simpler and more social.

OTT players are also taking note. Facebook's Instagram has recently introduced a new Instagram TV service (IGTV) where users can watch longer videos (up to an hour long) on their phones.

In Latin America, mobile video consumption has been climbing rapidly due to growing penetration of smartphones in the region - from 23% five years ago to 65% now.

RCS

RCS (Rich Communications Services), the next-gen operator messaging is going through a revival. Last time, we saw RCS in a big way was a while ago with the name Joyn. Yet, it had challenges to get off the ground along with a slew of OTT competitors. This new round of global RCS standards (no longer referred to as Joyn) will allow rich messaging – that includes video and spam-free messaging – for both personal and business use cases. GSMA expects RCS B2C market to go from \$60B a year today to \$90B a year by 2021. Total monthly active users are expected to grow from 167M today to 350M by 2019.

And One More Thing...

Parallel to this event, Apple held its own event to announce the new iPhones: XS, XS Max, and XR. Both models of the iPhone X have eSIM (embedded SIM) in addition to the regular SIM, which will allow users to have multiple phone numbers and easily change mobile operators.

*: Source: GSMA Intelligence

Disclosure: Azita Arvani runs Innovation Partner and Ecosystem Ventures at Nokia. This report does not reflect Nokia's views.

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