

AN ALERT FROM THE BDO TECHNOLOGY PRACTICE

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WHAT TO EXPECT FROM 5G, THE NEXT GENERATION OF WIRELESS NETWORKS

By Tom Mannion

The telecommunications industry is bracing itself for the arrival of the latest generation of wireless technology: 5G, or fifth generation mobile networks. The expected arrival date is to be determined, but many believe it will debut during the Tokyo Olympic Games in 2020. However, it very well may be sooner: Just earlier this year, AT&T announced that it will roll out 5G networks in a dozen U.S. cities by the end of 2018.

Each subsequent "G," or generation, of wireless technology contains higher data transmission speeds and different encoding methods than the one preceding it. New generations are developed about every decade. The first generation, 1G, started in 1981 and was based on analog cellular technology, followed by 2G in 1992, which was digitally based. In 2001, 3G improved download speeds from 200 kilobits per second (Kbps) to a few megabits per second (Mbps). Our present network, 4G, was launched in 2009 and uses various technologies such as WiMax and Long-Term Evolution (LTE).

WHAT TO EXPECT FROM 5G

5G is expected to have much higher speeds and capacity, and much lower latency (the lag between initiating an action and getting a response), than 4G. Because 5G can send and receive signals almost instantaneously, it is expected that 5G will offer mobile internet speeds of more than 10 gigabits per second (Gbps), approximately a hundred times faster than 4G. The latency will be less than a millisecond with 5G. As an example of its impressive speed, a 5G user could download a feature-length movie in High Definition in less than five seconds.

In addition to faster download speeds, 5G is expected to facilitate the implementation and adoption of the Internet of Things (IoT). This could have huge implications for industries like manufacturing that increasingly rely on the IoT for digitally connecting their processes and factories.



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Finally, the new technology could make wired internet connections a thing of the past. Sure, fiber optics will find uses in backhaul traffic, but telecoms companies expect to save money in the future by not having to create last mile cable access for customers.

PREPARING FOR 5G

Carriers, telecommunications manufacturers and various technology companies are actively working to define the global standards necessary to streamline mainstream 5G processes. Some logistical questions for its implementation still need to be solved, such as what band of spectrum 5G should occupy, as well as what wireless technologies should be used. Non-tech companies will also want a seat at the 5G discussion table. For example, media companies will push for better access to 5G so that consumers can enjoy higher resolutions with the videos they stream. Clearly, companies are working to take the lead on leveraging the incipient technology.

In fact, many countries such as China, South Korea and the U.S. have already begun to trial the technology, and many other countries are expected to follow with spectrum sales or auctions over the next 12 months. In the coming years, telecoms companies are expected to invest heavily in capital expenditures to cover implementation costs, such as installing new towers in rural areas and mobile hotspots in dense urban areas, in the hope of enabling their technology to reach the speed of 10 Gbps.

At the same time, companies are expected to invest in systems that can handle the expected surge in data traffic. 5G will demand more spectrum bandwidth as data volumes are expected to soar and the cost of spectrum to increase. The exact bandwidth of spectrum is expected to be settled in 2019, when the World Radiocommunication Conference will convene. Most industry observers feel that 5G will reside in very high frequencies known as "millimetre waves."

Innovation in wireless technology (chips, operating systems, apps, etc.) have typically come from U.S.-based venture capital-

backed tech companies. To respond to the 5G challenge, many telecom companies have successfully set up innovation incubators around 5G development. Operating at arm's length to the corporate entity, these incubators have a 'start-up' mind-set, generating and prototyping ideas for the company to build into its future planning.

LOOKING AHEAD: THE OPPORTUNITIES FOR TELECOMS & TECH COMPANIES

Many telecommunications companies, particularly in Europe, are encountering obstacles when they present the higher cost of increased data usage to their customers. Nevertheless, many carriers are also realizing the many business opportunities 5G brings—including new sources of revenue from avenues that capitalize on the growth of the IoT, such as smartwatches, other wearable items and sensors embedded in industrial products that can be connected to 5G networks. These opportunities are available to both carriers and tech companies worldwide.

Although the telecommunications industry is highly concentrated, further industry consolidation involving the makers of 5G technologies and telco equipment companies can also be expected. In fact, some countries may be left with just one wireless infrastructure provider. This consolidation will help contribute to the expected standardization of 5G technology.

Investing in and building a 5G network will generate \$533 billion in U.S. GDP over a 7-year period and \$1.2 trillion in long-run consumer benefits, according to the American Consumer Institute Center for Citizen Research. Tech companies specializing in the IoT or wireless technologies will need to continue their education of, and investment in, 5G technology or risk losing out on its full market potential.



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