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ROLE OF 5G WIRELESS SYSTEMS IN FUTURE

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ABSTRACT :

5G goes far beyond what we think of today as cell phones. We're at the start of a revolution in the world of connected things, with the first steps toward implementing 5G — the newest generation of telecom networks — already in full motion. To some, 5G promises to simply improve cellular capabilities, providing enhanced broadband power and boosting mobile capacity and data rates. In fact, 5G is 10 to 50 times faster than previous generations of cellular networks. Future 5G wireless networks will aspect new contests, as well as growing claim on network capacity to support a huge number of devices running application necessitating high data rates and always-on connectivity; hugely and supportive the emerging business models in the wireless network market demanding networks to be more open. New challenges initiative new resolutions and involve changed plans in the network positioning, management, and operation of future 5G wireless networks equated to those of current wireless networks. One of the key purposes of future 5G wireless networks is to compliantly provide service-customized networks to a wide variety of services using integrated cloud reserve and wireless/wired network possessions, which may be presented by several infrastructure providers and/or operators.

Keywords: Future, 5G, Wireless, Capacity.

INTRODUCTION

5G technology improves more than just connection speed — its greatest advantage is its ultra-fast response time, also known as latency. 5G's ultra-reliable low-latency communication (URLLC) is what really makes 5G stand out compared to previous cellular generations. In fact, the technology enables responses that are 250 times faster than humans. For instance, a car manufacturer can avoid

damages to car parts using 5G's high reliability and is seamlessly able to keep up the pace of the assembly line due to 5G's low latency. This creates a foundation to support innovations that were previously not possible with other connectivity technologies.5G Technology stands for 5th generation mobile technology. 5G represent the next major phase of mobile telecommunication ethics beyond the upcoming 4G standards. 5G technology is contribution the service in Product Manufacturing, Documentation, supporting electronic communications, etc. As the purchaser become more and more aware of the mobile phone technology, he or she will look for a decent package all together including all the advanced features a cellular phone can have. Hence the search for new technology always the main motivation of the top cell phone colossuses to out innovate their competitors. The aim of a 5G based telecommunication network would perfectly answer the challenges that a 4G prototypical would present once it has entered ubiquitous use. No one company or person owns 5G, but there are numerous companies in the mobile ecosystem that are causative to bringing 5G to life. Qualcomm has played a major role in originating the many introductory technologies that drive the industry forward and make up 5G, the next wireless standard.

REVIEW OF LITERATURE

Industries with stringent connectivity requirements stand to benefit the most from 5G's low latency technology. In the automotive industry, 5G is the missing element to reach peak safety for autonomous cars. The technology enables quick data transmission and the ability to interact with the road and with other vehicles on a level that can avoid crashes and streamline the drive. With a 5G-connected vehicle, car manufacturers can also receive data insights and analytics used to update the software or fix issues remotely, completely transforming the car owner's experience. South Korea is the country which arrayed the lead as far as penetration of the technology goes, by 2025, nearly 60 percent of mobile contributions in South Korea are anticipated to be for 5G networks.

Huawei Technology Co. owns the utmost copyrights on the next-generation of 5G technology, confirming the Chinese company will get paid despite Trump administration exertions to erase it from the supply chain, according to a new study.

Wireless systems using Orthogonal Frequency Division Multiplexing (OFDM) with extensive area coverage, high amount at millimeter waves (10 mm to 1 mm) covering a frequency range of 30 GHz to 300 GHz, and permitting a 20 Mbps data rate to distances up to 2 km. The millimeter- wave band is the most active solution to the current surge in wireless Internet usage. These provisions are capable of providing wireless world wide web (WWWW) applications.

What is 5G?

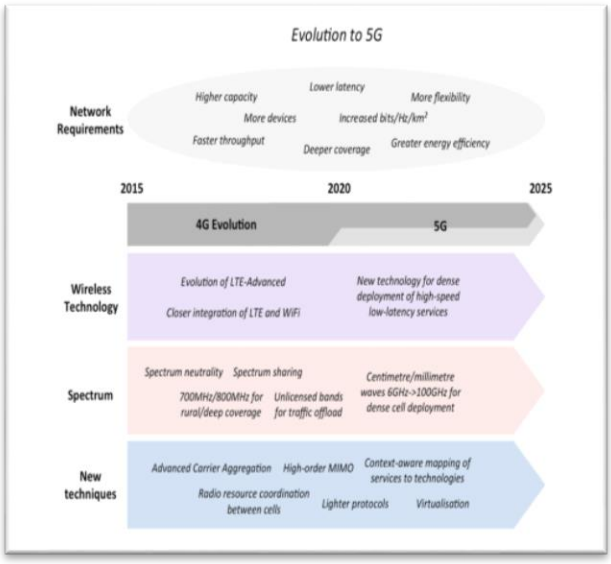
5G technology is a breakthrough. The next-generation of telecom networks (fifth generation or 5G) has started beating the market end of 2018 and will continue to increase worldwide.

Elsewhere the speed of development, the technology is predictable to unleash a massive 5G first 5G networks and the state is expected to stay in IoT (Internet of Things) ecosystem where networks can assist communication wants for billions of connected devices, with the right trade between speed, latency, and cost.

5G technology specification requirements:

- Up to 10Gbps data rate -10 to 100x speed development over 4G and 4.5G networks
- 1-millisecond latency
- 1000x bandwidth per unit area
- Up to 100x number of coupled devices per unit area (compared with 4G LTE) 99.999% availability
- 100% coverage
- 90% reduction in network energy usage

Evolution to 5G



Network requirements

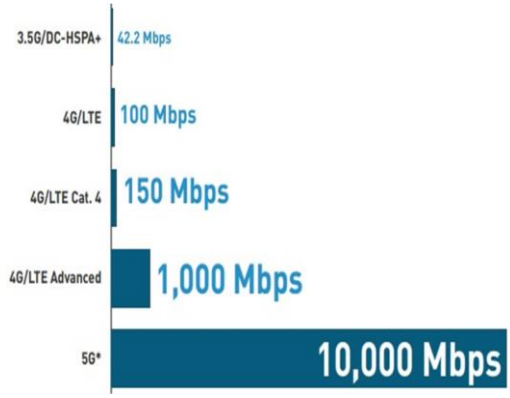
A unique objective for 5G networks is to support the appreciation in mobile data consumption, with users craving higher data speeds and traffic volumes expected to increase by hundreds. It is likely that 5G networks will have to transport reference point data speeds of 100Mbit/s and peak speeds of up to 10Gbit/s. Not only will there be a need to cope with the total volume of traffic, but the meditation of traffic in some locations, such as business districts and commuter hubs, will require new approaches. With wireless technologies already impending the Shannon limit for bits/Hz on individual radio links, the focus must turn to packing in more base stations in a given area, to achieve considerable rises in bits/Hz/km2.

Spectrum

As the demands on mobile communication networks rise, the purchase and resourceful use of spectrum will become more important than ever. Satisfying the forthcoming demands will involve better use of the spectrum that is already available to mobile networks, access to additional bandwidth at similar frequencies and the manipulation of higher frequencies in the centimeter-wave and millimeter- wave bands.

How fast is 5G?

5G speed max out at 10 gigabits per second (Gbps).



What makes 5G faster?

The use of shorter frequencies (millimeter waves between 30GHz and 300GHz) for 5G networks is why 5G can be faster. This high- band 5G spectrum affords the predictable boost not only in speed but also in capacity, low latency, and quality.

However, 5G download speed may vary widely by area. According to the February 2020 matter of Prosperity Magazine, average 5G speed travels done in Q3/Q4 2019 range from:220 megabytes per second (Mbps) in Las Vegas, 350 in New York,380 in Los Angeles, 450 in Dallas, to 550 Chicago, and over 950 in Minneapolis and Providence approximatively.

Will 5G technology be secure?

4G networks use the USIM tender to achieve strong mutual authentication between the user and the connected devices and the networks. The entity introducing the USIM application can be a removable SIM card or an embedded UICC chip. This strong mutual authentication is decisive to enable trusted services.

Today, security solutions are already a mix of security at the device and security at the network. Profuse security frameworks may co-exist in the future, and 5G is likely to re-use remaining solutions used today for 4G networks and the cloud (SEs, HSM, certification, Over-The-Air provisioning, and KMS). The standard for strong mutual authentication for 5G networks was settled in 2018.The need for 5G security, privacy, and the trust will be as robust as for 4G, if not stronger, with the tender impact of IoT services. Local SEs in devices can secure network admittance and support secure service area such as emergency call management and virtual networks for IoT.

ADVANTAGES OF 5G TECHNOLOGY

Industries being disrupted by 5G

5G's quantum leap in connectivity creates tremendous opportunities for numerous industries but also sets the stage for large-scale disruption. Industries such as healthcare, manufacturing, and auto are already adopting technologies and becoming more connected. Once 5G becomes widespread, the effect on these industries could be transformative for 3 main reasons:

5G offers lower latency, enabling faster transmission of larger data streams

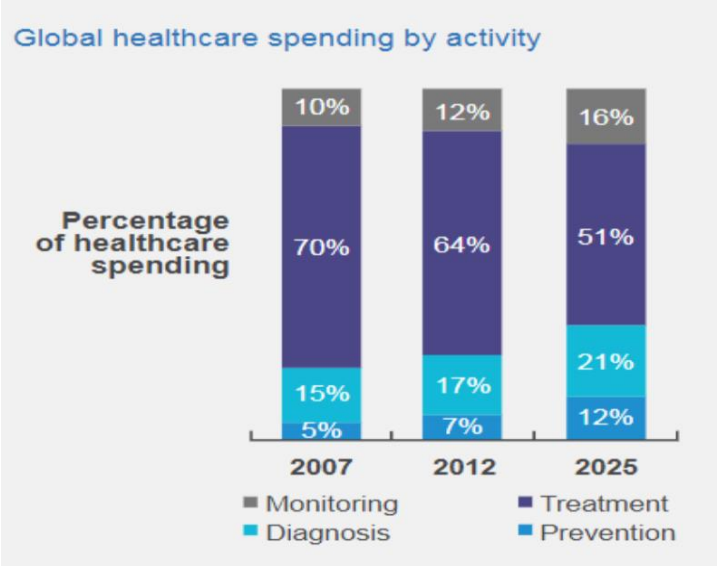
5G is more reliable, enabling better transmission of data in extreme conditions

5G is more flexible than Wi-Fi and can support a wider range of devices, sensors, and wearables

We dive into several industries set to be impacted by 5G below.

HEALTHCARE

With the goal of reducing costs and improving health outcomes, healthcare spending is shifting towards preventative care.



Source: Principal Global

5G offers an enormous opportunity for expanding preventative and monitoring practices via wearable devices. Such devices are already being used to track everything from sleep to blood glucose levels to physical activity, among other things. 5G's faster speeds and greater network reliability will allow for the development of more complex devices, including those implanted directly into a human body rather than worn externally.

Microscopic cameras equipped with 5G will be able to provide real-time video streaming in and out of patients' bodies, setting the groundwork for more remote diagnoses and other more complex telehealth practices. Today, for example, recovering stroke patients for whom repeated hospital visits are a burden often suffer from a lack of home monitoring and care. New kinds of wearables that track patients around their daily lives — not easy today with 4G — could allow for such patients to get more personalized monitoring and telemedicine-based care without having to visit a hospital. Telemedicine is projected to grow to a $190B market by 2026, according to CB Insights' Industry Analysts Consensus market sizing tool. While the telemedicine sector was poised to experience strong growth pre-pandemic, the Covid-19 pandemic accelerated the demand for telehealth services dramatically.

In the field of remote-controlled robotic surgery, 5G has the potential to dramatically expand the ability of doctors to bring critical and specialized care services to patients worldwide. Conducting robotic surgery remotely is feasible today, especially in dense urban areas with access to fast broadband internet, but doctors generally have to be located in the same operating theater as the patient for it to work. But by allowing for low latency and jitter-free communication over long distances, 5G could enable operations to take place from anywhere in the world. In January 2019, a team in China tested 5G remote surgery, removing an animal's liver in the province of Fujian. In the US, Rush University System for Health is trialing 5G connectivity in its hospitals, in partnership with AT&T.

MANUFACTURING

The manufacturing industry has already started adopting artificial intelligence and IoT technologies to increase efficiency, improve data collection, and build better predictive analytics. With 5G, manufacturers gain a faster, more reliable means of collecting and transmitting that data, as well as a broader range of sensors and devices they can integrate into their factories and workflows.

One area that will see major improvements with 5G is augmented reality (AR) for manufacturing. Ericsson began testing augmented reality troubleshooting in its Tallinn, Estonia factory in January 2018. With an AR app, technicians can observe a part that needs maintenance and pull up the relevant schematics and instructions within their field of vision, drastically shortening the time it takes to complete the repair. Ericsson has also partnered with MTU Aero Engines, an airplane engine manufacturer, and Germany's Fraunhofer Institute for Production Technology to test 5G tech. Ericsson says that this initiative could lead to savings of around 27M euros for a single factory.

Ericsson has also applied 5G to its own operations. For example, it started producing its Street Macro base station at its smart factory in Lewisville, Texas, in March 2020. The 300,000-square-foot Lewisville factory relies heavily on 5G technologies to boost production efficiency through applications like "connected" logistics, automated assembly.

A technician repairs a circuit board using an augmented reality overlay at Ericsson's Tallinn factory. Source: Ericsson Another major benefit of 5G technology is the ability to run multiple dedicated networks on the same infrastructure to customize speed, coverage, security — also known as slicing. Even though the ability to run separate networks already exists, slicing could make it easier to tailor them to manufacturing processes and improve adaptability, like accommodating increased volumes of production. The popularity of the technology is such that two-thirds of industrial companies want to deploy it within 2 years of availability, according to a 2019 report by digital transformation consultancy Capgemini.

AUTOMOTIVE

Tesla, Google, and others have been racing for years to build the first viable autonomous vehicle capable of navigating any environment without the input of a human driver. Their primary approach to the problem thus far uses onboard computers and radar to scan the environment around the vehicle and decide a car's next movement based on the information. Some companies, including Qualcomm, Ericsson, Huawei, and Nokia, are looking to 5G and edge computing as a potential solution to the problems faced by autonomous vehicles. Their consortium, the 5G Automotive Association (5GAA), began work on "cellular-vehicle-to-everything," or C-V2X, technology in 2016. Rather than cars determining individually how to act, in the C-V2X system, driverless vehicles communicate with one another and with parts of the physical environment like traffic lights and construction signs in order to coordinate movements safely and efficiently. The system is in a testing phase today, but researchers believe 5G could help enable truly autonomous driving in the future.

C-V2X technologies could reshape the automotive sector, as well as how urban planners design cities to optimize traffic flow. Many of the technology's primary applications relate to safety, such as automatic notifications that alert motorists to vehicles traveling in the wrong direction on one-way roads. The number of automotive 5G connections is expected to reach 96M by 2027, according to telecoms consultancy Analysis Mason. 5G availability would mean a greater density of sensors in the environment and faster data transmission from centralized servers to those sensors and vehicles — and as a result, faster improvement via machine learning algorithms. The average autonomous car of the future could produce as much as 2M gigabytes of data per week, and moving all of that data to the cloud or a regional server isn't feasible today with Wi-Fi or 4G.

The automotive sector represents one of the largest market opportunities for manufacturers of 5G technologies. However, while American automakers such as Ford are exploring the potential of 5G in their forthcoming vehicles, US companies lag behind those in China by a considerable margin. As of May 2021, China is the only country in which vehicular technologies such as C-V2X are already commercially available. Both FAW Group Corp., a state-run automotive manufacturer, and BYD Co. Ltd. began offering vehicles featuring C-V2X technology in 2020, giving Chinese automakers a substantial head starts on their American counterparts, which do not expect to introduce C-V2X-enabled models until 2022. Huawei, which has been at the center of ongoing trade disputes between China and the US since 2018, has been working with several European automotive companies, including Audi and BMW, to test experimental technologies such as remote-controlled driving capabilities using 5G.

RETAIL

Over the last several years, retailers have invested millions in smart technologies to help customers shop more efficiently

and check out faster while also collecting more data on the customer experience. From in-store analytics to visual recognition-driven shelf monitoring, all depend on or benefit from the ability to transmit large amounts of data and access high-throughput connections, which is why 5G stands to have such a large impact on the way retailers operate.

Current "smart shelves" incorporating RFID technology, for example, can tell a business owner the ratio of item pick-ups to sales and display dynamic prices. With 5G technology, shelves equipped with sensors could determine low stock on a product, ping a distribution center to restock its inventory, and dynamically monitor the progress of that shipment. The amount of data needed to move over the mobile network is too great for existing infrastructure, according to AT&T. Today, companies like Sephora use virtual try-on technology to help in-store customers see what a particular makeup would look like on them before they buy, but the product is constricted by data streaming limits. 5G technology eliminates such limits — we could one day be using data-heavy applications like trying on clothes in augmented reality with photo-realistic accuracy.

The possibilities offered by 5G are likely to transform the retail sector in the coming years, providing opportunities for major technology companies to create new product offerings. In February 2021, Verizon Business announced a new 5G-enabled mobile edge computing (MEC) platform developed in partnership with Deloitte and SAP. The platform promises to offer retailers real-time analytics on in-store consumer behavior via sophisticated sensor networks combined with augmented reality and artificial intelligence. Verizon's platform could also solve some common retail challenges, such as real-time inventory management.

Verizon is also investing in startups working to bring new wireless technologies to the retail sector. In June 2021, Verizon partnered with British digital agency Digital Catapult to launch the Verizon 5G Immersive Retail Accelerator. The program will nurture early-stage telecommunications startups to develop new technologies for use in the retail and customer experience spaces.

5G also has the potential to create entirely new types of shopping experiences: an augmented reality application on your smartphone, for example, that triggers when you enter a store and guides you directly to the shelf where you can find your items of choice. The physical groundwork for these kinds of experiences is already occurring with cashier-less retail (e.g., Amazon Go). Improvements in connectivity — as a result of 5G technology — could increase retail revenue by $12B annually by the end of 2021, according to Adobe Digital Insights.

ENTERTAINMENT

Media giants such as Fox and Warner Brothers have already begun to explore the use of 5G technology. Download speeds will also increase dramatically over 5G, making movie, game, and TV downloads possible in seconds rather than minutes — allowing for better quality music, higher-res films, and streaming high-spec games. Better mobile connectivity is projected to propel global mobile media revenue to $420B annually by 2028, according to a 2018 Intel/Ovum report. 5G will be able to offer live streaming of unparalleled quality. Amazon and Dish Network are already in negotiations to jointly build and support a 5G network.

5G could have an even more transformative effect on augmented reality (AR) and virtual reality (VR). VR and AR applications have a higher field of view, resolution, and frame rate than conventional media, and as such require a significantly higher level of bandwidth and lower level of latency in order to transmit a consistent experience to the viewer. Your typical 4G connection has about 60ms of latency, far too slow for the VR experience, which can become disorienting and jarring even at 15ms. 5G, on the other hand, promises a latency of between 1-4 milliseconds. Faster connectivity through 5G will also be revolutionary for the e-sports and gaming industry, where quick response times can often determine a player's success. Mobile 5G gaming revenue is expected to be worth $100B by 2028, according to the Intel/Ovum report.

ENERGY

With high speeds and low latency, 5G could help enable more cost-effective energy transmission. Faster connection speeds could result in energy grids being more efficiently managed, which, in turn, could lead to less downtime. For example, in the event of a power outage, 5G-equipped smart

power grids could quickly provide insights into the problem using data and sensors. The tech could also lead to a more stable supply of energy, as suppliers would be equipped to make better-informed decisions about the distribution of power based on vast amounts of data and smart sensors.

5G could allow for more efficient transmission and management of energy.

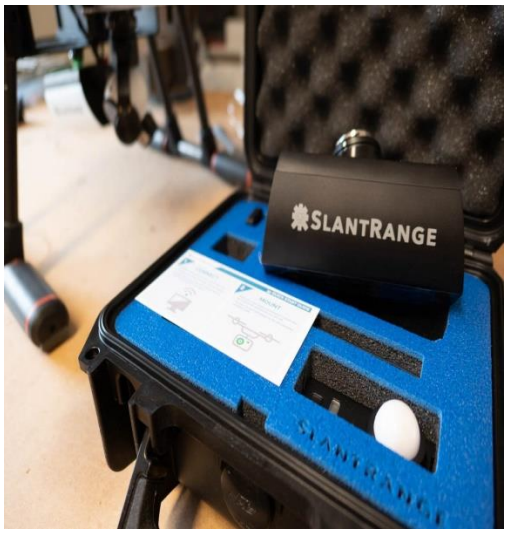
A version of this type of smart grid can be seen in Hawaii, where a system built in collaboration with Verizon analyzes outages and monitors meters. Better connectivity could also have upsides on the consumption end. Streetlights connected with 5G technology and equipped with sensors could dim if there aren't any people or vehicles on the road, thus saving energy. This approach could lead to savings of up to $1B annually in the US, according to a report from Accenture.

With 5G allowing better connectivity between devices, more homes will likely become equipped with smart meters. These meters will be able to provide insight into the energy consumption of different home appliances and devices, giving homeowners more information to manage their energy use. Verizon believes that the energy industry will be a key demonstration of 5G's potential, with the company stating that the sector will be one of the "most significant test cases" for 5G technology.

5G could also be more energy-efficient to use than previous generations of wireless cellular tech. Research conducted by Finnish telecom giant Nokia and Spanish multinational Telefónica suggests that 5G technologies are up to 90% more energy efficient per traffic unit than 4G networks — though 5G networks are expected to handle much more traffic and will need lots new equipment, which may blunt the potential for overall energy savings.

AGRICULTURE

5G will offer farmers the opportunity to get faster, more accurate information in the field — which could help to increase outputs like crop yield and make it easier to prevent common crop and wildlife illnesses. Companies such as SlantRange are already providing drone services for farmers to gain insight into their crops. With 5G connectivity, such services could operate with much more accuracy. Autonomous tractors, for example, may eventually use 5G to pair with drones to guide their work, like identifying which parts of a field needs fertilizer



Source: Slantrange

Precision farming is expected to see major improvements with 5G technology. For resource-intensive crops, factors such as soil health need to be monitored to help increase yield. Syncing a precision farming process using current 4G LTE networks can take about 30-60 seconds. With 5G, this

process can be brought down to less than one second, according to John Deere Technology Innovation Center.

The Food Resiliency Project is an example of an initiative that has brought together different stakeholders to find ways to apply 5G to farming. For instance, the project has combined edge computing technology, IoT deployments, and 5G networks to improve crop yields by continuously analyzing soil conditions.

FINANCIAL SERVICES

With the growth of mobile banking and fintech, financial services have been moving towards greater personalization and ease of access for the last decade. But 5G has the potential to accelerate that transition and transform banking

into a more ubiquitous and instantaneous process. For example, mobile payments could happen much faster and more reliably as multiple processes could be executed in parallel. In July 2021, Verizon Business and Mastercard announced a partnership to develop a range of 5G and MEC services, including Mastercard's Tap on Phone mobile point of sale (PoS) product, autonomous checkout technologies for retail stores, and a mobile-first bill paying service, among other initiatives. The companies are continuing to research applications of 5G technologies at Mastercard's Tech Hub in Manhattan.

Some observers are betting on 5G to bring better banking to areas where physical branches aren't present. AT&T, for example, is reportedly developing mobile branches for banks in the US, which will be connected using 5G technology. These mobile branches are envisioned as serving scenarios like music festivals, pop-up shops, and remote areas with low banking needs. The banking sector's efforts towards providing greater personalization in services will also likely get a boost from 5G. For example, increased data collection that enables sharper artificial intelligence capabilities could provide insights that allow banks to deliver highly-tailored services to customers.

SUPPLY CHAIN MANAGEMENT

By making digital communication more ubiquitous, 5G tech has the potential to transform nearly every part of the supply chain. In a warehouse, for example, 5G-connected devices coupled with sensors would allow quicker communication, collection of a larger amount of data, and faster responses to breakdowns. One application of 5G tech in supply chains is tracking and tracing packaging or parts in real time. Faster internet speeds, connected sensors, and more bandwidth could make it possible for companies to continuously monitor the condition of individual packages being shipped. This ability to better track individual packages could also streamline insurance claims for damaged shipments. With 5G-enabled sensors attached to packages, it would be easier to monitor their status — including variables like temperature, moisture, and location — information that would help stakeholders identify where things went wrong and claim insurance accordingly.

Logistics firm Ice Mobility has been testing 5G technologies to improve the efficiency of its packing operations since October 2020. Specifically, Ice Mobility has been using computer-vision technologies as part of a partnership with Microsoft and Verizon to improve its quality assurance processes. 5G and MEC technologies allow Ice Mobility to analyze packing operations in real time and identify potential faults with packing at the time of processing. The company estimates the time savings offered by these technologies could improve processing times by up to 30%.

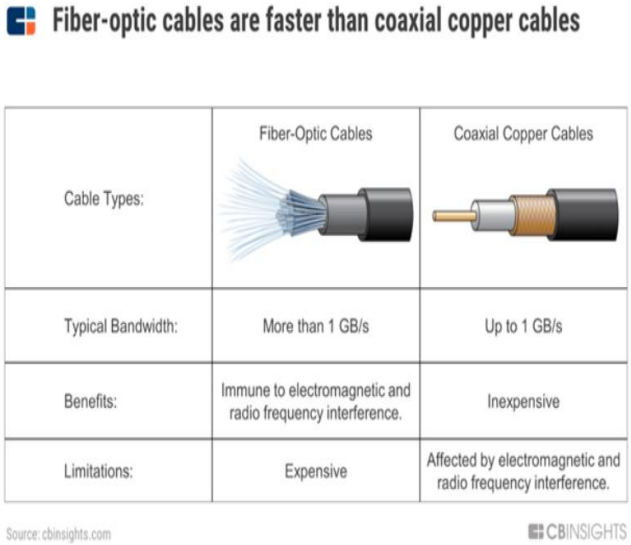
Autonomous delivery, which is already being tested by companies like DHL, is another area that could receive a boost from 5G connectivity. As a larger number of devices will be able to latch on to the same network, it will allow companies to deploy more connected autonomous vehicles in dense areas.

Four drivers paving the way for 5G

Below, we identify 4 primary drivers that will drive widespread 5G adoption and highlight how they will contribute to the deployment and use of 5G systems.

FIBER-OPTIC INFRASTRUCTURE

While sometimes perceived as competing technologies, fiber-optic networks and wireless networks actually work in tandem.



Data travels through wires the majority of the time, with wireless antennas typically completing the last few miles of delivery. In this way, fiber functions as the nervous system of a mobile network. Connecting data centers to cellular antennas (cell towers or small cells) with fiber allows for the near real-time speeds expected from 5G — without fiber, there would be a weak link in the data transmission. Fiber-optic infrastructure is prevalent today and used by current 4G systems, but much more will be required to support widespread 5G.

Disadvantages of 5G Technology

However, 5G technology is examined and abstracted to solve all radio signal problems and hardship of mobile world, but because of some security reason and lack of technological development in most of the geographic sections, it has following limitations

- Technology is silent under process and research on its possibility is going on.
- The speed, this technology is pleasing seems tough to achieve (in future, it might be) because of the useless technological support in most parts of the world.
- Many of the old devices would not be able to 5G, hence, all of them need to be swapped with a new one expensive deal.
- Developing infrastructure needs high cost.
- Security and privacy problems yet to be solved.

FUTURE SCOPE

5G enthusiasts, however, understand infrastructure costs are a small price to pay in comparison to the massive potential that 5G-powered innovation holds in transforming our world. The network is positioned to set forth a full-scale deployment of low-latency, massive IoT throughout practically every industry. Enterprises will experience large-scale process automation with the advent of massive machine-type communication (mMTC), mobile robotics and cloud robotics, to name a few.

The platform will also reshape the consumer experience of electronic goods, unlocking a new era in mobile videos and introducing massive growth in IoT and smart devices, as well as greater AR/VR capabilities. Global 5G implementation requires a complete overhaul of communications infrastructure, but the revolution 5G promises far outweighs its obstacles.

In the upcoming, 5G will offer higher qualities of services, lower latency, and higher bandwidth, which will help improve user experiences both in the consumer and business space, from cloud gaming, to telehealth use cases.

By Sergey Seletskyi, IoT Practice Leader and Senior Solution Architect at Intellias. 5G networks will reform the Internet of Things (IoT). But it will take some years for the technology to cover most of the planet.

For most people, 5G will handle the wide- area wireless connection, and Wi-Fi will handle the local wireless connection. Ultimately, however, there could certainly come a time when only one of them will be essential. It may seem irrational to think that Wi-Fi could go away, especially given how pervasive it is today. Improved Spectrum – greater capacity, more users and faster speed. In many countries the original frequency bands for 5G are below 6 GHz and similar frequencies to remaining mobile and Wi-Fi networks

CONCLUSION

5G Technology stands for 5th Generation Mobile technology. 5G mobile technology has altered the means to use cell phones within very high bandwidth. Users never experienced

continually before such a high value technology.

Nowadays mobile users have much awareness of the cell phones (mobile) technology. The 5G technologies include all the types of innovative structures which makes 5G mobile technology most powerful and in a huge demand in near future.

A user can also catch their 5G technology cell phone with their Laptop to get broadband internet access. 5G technology with camera, MP3, video play-actor, large phone memory, audio player and much more you never imagine. For children astounding fun Bluetooth technology and Piconets has become in market.

The concept of fifth generation wireless communication technology WWWW is initiated from fourth generation LTE technique. Accordingly, fifth generation should create a significant divergence and include few extra services and traits to the global over fourth generation. Fifth generation must be gifted technology that communicates the globe with no edges. Consequently, in this article the main importance of fifth generation wireless communication systems are proposed and also the issues and challenges of fifth generation communication systems are also described. The major benefit of switching to 5G is convergence of multi-network functions in order to reduce the complexity, cost, power, rapid speed and incredibly low latency. Even though 5G provides better infrastructure for new business models, help to streamline communications, organizing to handle big data using its efficient transfer speed without going away from its core function. That is to serve as a mobile network. Also 5G enable us to explore technologies like virtual reality (VR) and augmented reality (AR). In the future, it will lend his hands on new innovations such as remote robotic surgery and personalized wearable health trackers. Not but the least IoT security will be a source of major investment in forthcoming years.

REFERENCES

- Known as multipath. Adam Krumbein, “Understanding the Basics of MIMO Communication Technology,” Southwest Antennas (2016), https://www.rfmw.com/data/swa-mimo-basics.pdf.
- 3.Ted Rappaport and other researchers at NYU Wireless deserve credit for channel modeling that shows the promise of mmWave for 5G. See, e.g., Rappaport et al., “Millimeter Wave Mobile Communications for 5GCellular: It Will Work!” IEEE Access (2013), https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6515173.
- 4.Dean Bubley, “3 Emerging Models for Edge-Computing: Single-Network, Interconnected & Federated,” Disruptive Analysis (February 2019)
- , https://disruptivewireless.blogspot.com/2019/02/3-emerging-models-for-edge-computing.html.
- 5.Rui Dong et al., “Deep Learning for Hybrid 5G Services in Mobile Edge Computing Systems: Learn From a Digital Twin” IEEE Transactions on Wireless Communications Vol 18, Issue 10 (October 2019), https://ieeexplore.ieee.org/document/8764584.
- 6.Sue Marek, “Verizon partners with AWS to bring more power to its 5G edge,” FierceWireless (December2019), https://www.fiercewireless.com/5g/verizon-partners-aws-to-bring-more-power-to-its-5g-edge.
- https://www.bing.com/search?q=link+for+research+paper+reference&form=PRINEN&httpsmsn=1&msnews=1&refig=9255cbeda4a54d95a2a583828ee59d0d&sp=-1&pq=link+for+research+&sc=0-18&qs=n&sk=&cvid=9255cbeda4a54d95a2a583828ee59d0d#
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