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# What The Future Upholds!

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**Abstract:** *As the world is changing with better infrastructure, fiber, clouds, networks, data centers have become a source of providing information around the globe, providing us one of the biggest businesses, with a large amount of spending done over them. By the end of 2021, "Global Information Technology" is calculated to be spending $3.8 trillion over the companies shifting to the cloud. [1] The various networks of the software, hardware, infrastructure, databases: all are highly developed for making the IT to boom up for the incoming eras. Arthur C Clarke, once said, "any sufficiently advanced technology is indistinguishable from magic." Everything going to the advanced level, the shared amount of data relies on fast connectivity. There is a lot of talking going on the capabilities provided by the 5G from past few years, which is finally out with its first batch of 5G handsets have been announced hitting the market soon.[2]The market opportunities of various companies are as bigger as they have ever been. Organizations such as DARPA, IBM, Shipchain, Paxful, Circle [3] are few of the companies working on providing number of applications to the technological world. Companies such as Honeywell, Microsoft, AWS, Spunk, Google are actively working in order to update the computing capabilities which we are accessing upon by providing us with quantum world. [4]Quantum computing provides us a redefine form of what the computer is all about. It gives us the computing power which is billions of times more renowned and powerful than the computing environment we are existing in today. Subdermal technologies are overpowered with new rulings neuro link. In today's world, people working on completely virtual spaces with power assist fabrics (Digital fabrics) [5]. It provides human the evolution of added strength and gaining mobility to another level. United Nations have developed a universal translator, which in turn reduces the requirement of human interpreters and translators..*

**Keywords**: Introduction of various technologies of future such as: Artificial Intelligence, Internet Of Things, DARQ, Quantum Computing, Machine Learning, Virtual Reality & Augmented Reality, Cyber Security, As-a-service models, Automation, Various companies working on future technologies, main focused explanation on emerging trends of Wireless 5G Technology.

## I. INTRODUCTION

It is well said that the opportunities are significant, and they are the functional essence of the data, hence when we achieve the data, we are thriving for the need to store it and maintain it which is always placed and maintained within the technologies we develop. In today's world, the estimated 3 billion people have the constant access to the web, while the other 5 billion have either the limited access for a particular period of time or no access at all. Various of the larger organizations such as Facebook, Space-X, Google are working together in order to collaborate over the project that will bring the internet to the doorsteps of each and every user with the speed of 1 Mb/second. [6]


**Figure:** Development of machine learning over the years [7]

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Progress made over machine learning concept such as perfect electronic translators, navigation systems, providing better driving modes, with all of the other updated gadgets and software has make our life easier and more advanced. The communication has been outgrown throughout the world without having the language hesitation. [8]

The CEO of "Cisco Systems", Chuck Robbins said, that these 5G technologies have been developed in order to figure out how the VM could take advantages economically and create businesses around these technologies going forward. [9] The CEO of "Intel", Bob Swan, stated that "the 5G world, with not only specific organizations, but with almost all the organizations working on these new trends and technologies lately is defining in changing the world over, with a flip of a coin."It is expected that Blockchain market will grow to $3 billion by the end of the year 2020 and $39.7 billion by 2025., providing a CAGR of 67.3% in 2022-2025. [10] Blockchain are developed over programming languages, relational databases, web-app development, data structures, networking and fundamentals of Oops."The 5G world will help in moving the computation from the clouds to the data centers into the network. Few of the demonstrations provided as; connecting the ambulance with the help of 5G [11] to the hospitals, we could save millions of lives with faster response to the treatment given to the patients.", documented by Jordi Puignero, Government of Catalonia. In the next coming five years' "Artificial Intelligence" will make a huge progress by not only providing the answers to the simple questions, also following your commands, communicating with the owner itself in a more advanced way than Siri does today.

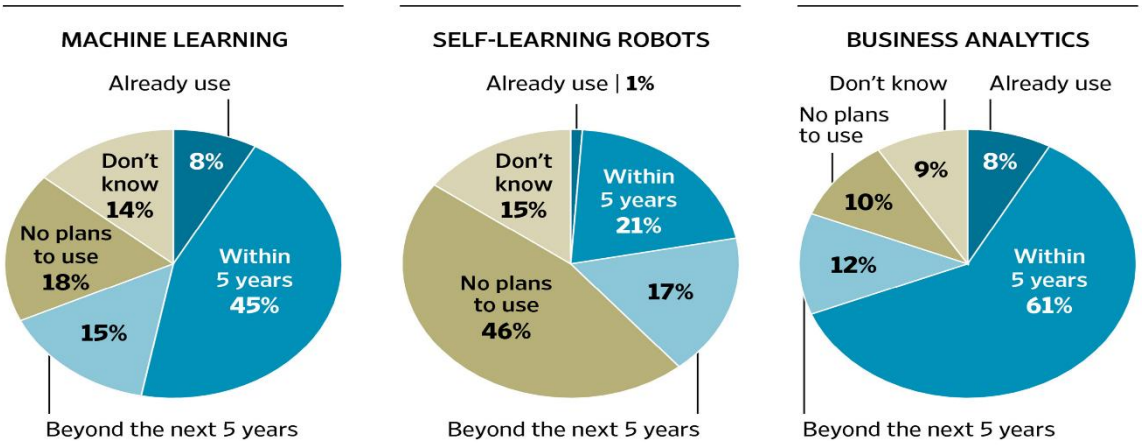


**Figure:** Artificial Intelligence survey by Lisa Davis [12]

One requires to have the access upon the fields such as linear algebra, probability, quantum mechanics, information theory, machine learning in order to deal with quantum computing.

Along with adding up to the technical infrastructure, a growing security industry is also required to protect their infrastructure as the more we use a data, the more it will become a treasure for the government, companies and even the attackers and hackers. Entertainment industry also approaches the space station as filming the sets on earth's orbit as well as on the moon, it's quite an interesting phenomenon to think about.Earth's 3D printed habitat production started on Mars, other companies interestingly producing water and oxygen for the arrival of more human explorers in the future.

With Artificial Intelligence, also comes the cognitive computing which provides a better exposure of ML, DL, NLP, speech recognition. In order to improvise the human decision making ability, accessing and taking advantages of all these technologies will provide better customer interactions as well as great data analysis. Also provide a hope for self-learning algorithms. [13]

## II. METHODS

It is well said that the 3G are the operator centric, 4G our service centric and the 5G is user centric., providing the design concept with an open platform over different layers, provided to the users at the rate they won't bargain, with better future and reliable experience of the technologies. South Korea became the first country to offer 5G on

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December 2018. With few other technologies estimated studies states that Internet of things (IOT) is itself used worldwide in 2019 by doing a business of $750 billion, by providing services to manufacturing, transportation and utility. [14]An estimation provided on the rapid technological progress in our 21st century, with this speeding changing behavior by 2025. we could have:

- Few researchers from "Thomson Reuters" are confirming on the modernized material with which the solar panels will be able to absorb more sunlight, which it is doing now and even in the case of overcast also leading to the facts that solar panel will beat fossil fuel energy output and will become the largest source of energy over the globe [15].
- Augmented and Virtual Reality will be a real thing as it will give us the freedom of taking a virtual tour around a hotel or a lobby, before booking the room, providing us the 3-D model of all the goods in a store before doing the shopping. [16]
- Problems of traffic's will be solved in a much improved way, Providing a congestion free routes.
- Internet of things or "IOT" will become the base of a day to day lives smartphone, smart offices everything is smart around, connected with everything else, which are separated just by only closed internal networks i.e. where the access will be provided in the blink of an eye,
- Robotics will be introduced into our lives to the common factors, everything will be performed automatically, the new picture covering whole of the globe with internet.
- Block chains will be another method for transferring money and assets communicating between different organizations or humans, will become a day to day service; one of the greatest examples of Block chain technology are "bitcoins" in crypto currencies, eliminating the use of middle sources in order to transfer money, which in turn provides more security and direct delivery.[17]

Now, let's talk about 5G, which is one of the most important phenomenon rolling out in the market, providing a revolutionary change within the market with a new way of interaction with its fastest speed, latency, ability to connect multiple devices at the same time. All of these relies heavily on the developers as giant economies such as Uber, food services. Other larger organizations didn't exist until 4G comes upon into our lives. High-speed connections provided to the small businesses are able to provide the services which one could not even think of existing it before the time. [18] From relaying data for autonomous vehicles and performing surgical procedure by remote doctors, reduction of pollution via maintaining sensors are all the qualitative measures 5G is promising to our world.

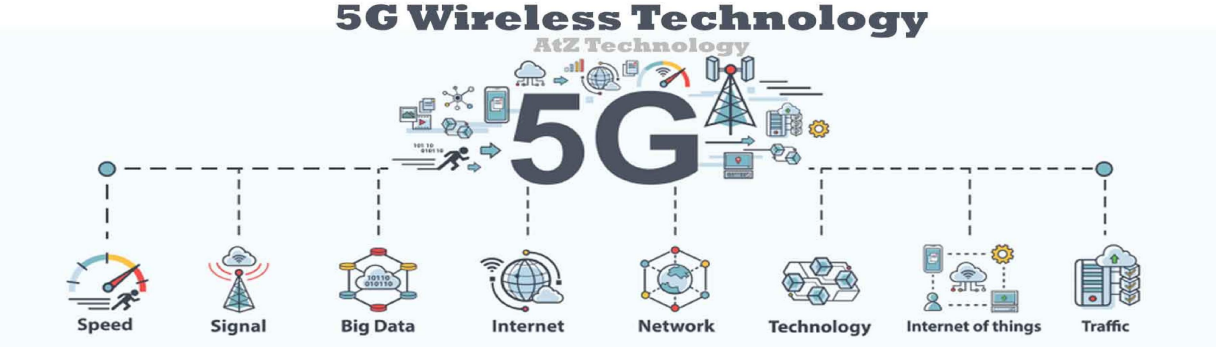


**Figure:** 5G Wireless technology [19]

It is the fifth generation of wireless technology stated as 5G. It is one of the wireless communications throughout the network without any recorded and noted limitation., providing a real world of wireless systems with an enormous transmission speeds. It provides worldwide with high communication connectivity over the cell phones as well as provides enormous data capabilities. Over our mobile phones more features as well as extra added functionalities are provided with larger memories, higher dialling speeds and more clear audio and video version visuals. [20]

After the introduction of 2G, 3G then 4G and 4G LTE, 5G is the future. FCC (Federal Corporation Commission) has provided the license to Apple to start experimenting and testing over the next generation technology in 2017. Samsung, Google, Apple, Facebook are few of the companies which have been listed here, working over this project. [21]

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- Earlier 3G services were used which provides the access of the signal from the nearest mobile towers with a phone through which various calls, internet, messages were made.
- After a while 4G services were applied which are five times faster than compared to the 3G services available services, providing with hundred "megabits/second" speed for the downloading purposes.
- After a little improvement, it was converted to 4G LTE which is nowadays, one of the fastest technologies we are using. But as with a growing population and a growing demand of better performances we have reached to the limit of 4G LTE services.
- As the future relies heavily on the innovations of new technology, hence, just relying on 4G LTE won't provide us with our future plans.

Technology is developing such as internet of things, autonomous driving, virtual reality and so on; highly demands the internet which provides the speed and exhibitions and accessibility at gigabits/second range. Thus, the need of a better internet services is required for future development of technologies and advances to be made in sciences. It is said that 5G consist of 10 times faster speed than the current working internet has. [22]

"Wireless communication"[23] could be explained as the transmission of information between various access points and the end users. Since the signal between these entities are the wireless transmissions, they are also known "Electromagnetic Signals". Information sent between these end units, in the signal waveform are sent in the form of digital; such as 0s and 1s: which describes a textured sound, images or video files and soon. With the advancements in technology and the increase usage of mobile devices, it's resulting in the fast growth of traffic, all applications tuned into the system, resulting in requiring more data with each passing time, more gigabytes for each process.

If you look at the scenario, from 2015 - 2021, Ericsson mobility report, we could see that the usage of per person per month has been shifted from 0.7 GB - 6.5GB, clearly resulting in 50% of annual increase. And if this will continue then in the near future, by 2034, it will be thousand times more. When we have such ratios and calculations in front of us we could not just sit back and wait for this technology to get its usage to the end limits, we require new technologies as soon as possible.

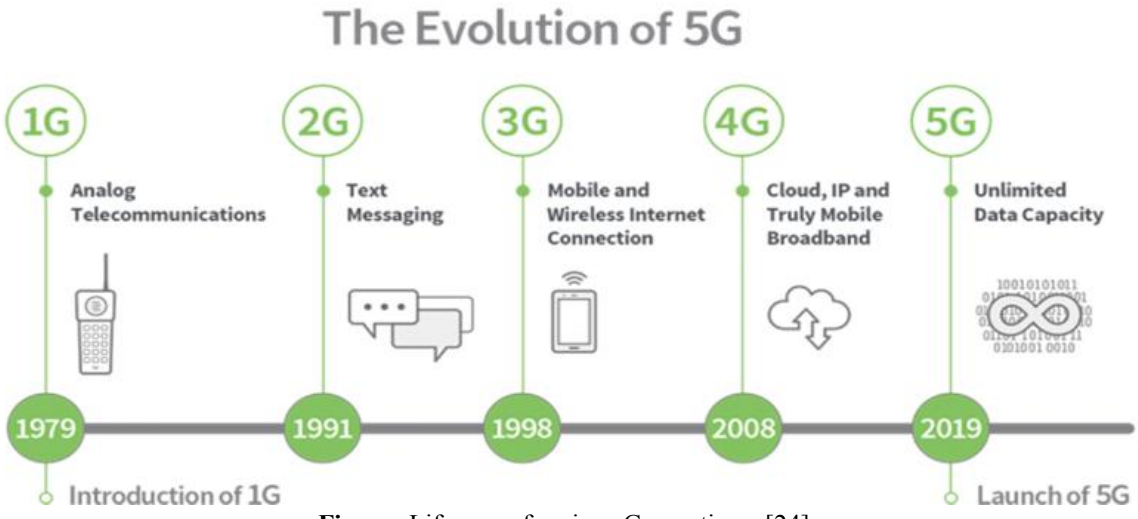


**Figure:** Lifespan of various Generations. [24]

Albert Einstein stated, "To look to the future, we must first look back upon the past, that is where the seeds of the future are planted. I never think of the future; it comes soon enough."

1. In Sweden, under the computing of Analogues Technology in 1979, **1G** was established, it provides at that time the efficiency of listening in a similar way, we listened to radio in the car. It was first bought to, Tokyo, later on, approved by U.S, in 1991,
2. **2G** systems showed up via digital technology, mainly used to access the phone calls in Finland,
3. In 1998 came into picture internet in the phone introducing the **3G** technology, launched by NIIT DoCoMo, by which, one can place calls, video calls, transfer video files and so on by Wireless Internet connections.

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4. By 2008, mobile broadband was the developed technology of **4G** network providing the cloud services, IP address and many more applications presented and laid in Sweden and Norway.
5. 10 years later, in 2020, we are operating on **5G.** It is thousand times faster, providing more data, having a robust and energy-efficient platform.

If we dig in deeper towards the past, it's not only 1G,2G,3G and so on, it has far more functionalities such as their speed and bandwidth, which over the period of time got enhanced with the future we are aiming at.

- 1G is based on the analog system providing the speed up to 2.4 KBPS, it was launched under advanced Mobile Phone System (AMPS), which allowed the user to make voice calls over in one country.
- 2G is based on the digital systems speeding up to 60.4Kbps, providing services such as digital Voice over and SMS with a clearer version, it is provided on Semi global facilitated term. 2G are few of the handsets which we still use till this date.
- 3G provides a transmission speed of about 12.5Kbps - 2Mbps, with usage of a good voice quality, video conferencing quality, email, PDA, online shopping, banking, games, surfing of internet etc. It has its accessibility over the globe in the form of roaming.
- 4G came into the picture in 2010 with faster and more reliable speed up to 100 Mbps, providing higher performances with lower the cost and better roaming facility.

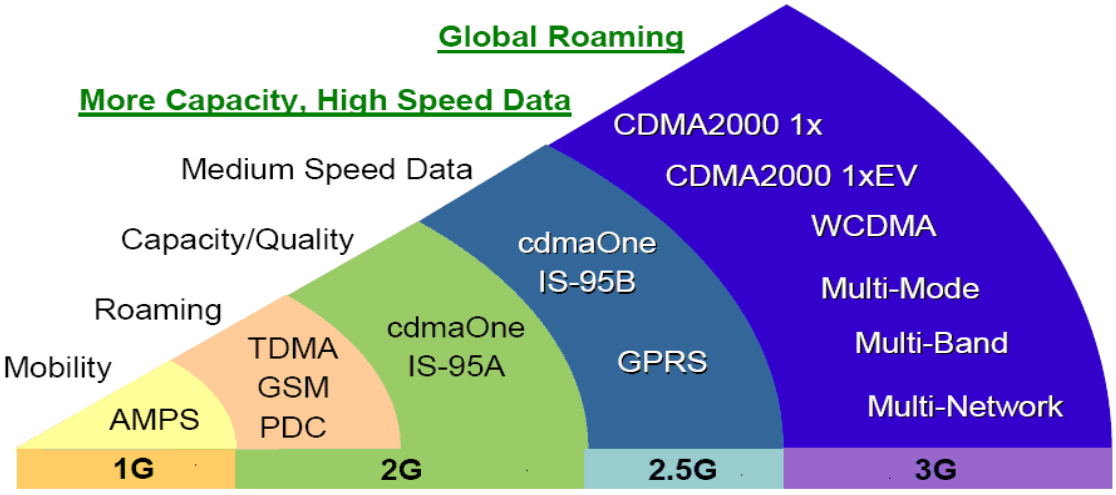


**Figure:** Mobile communication Generations [25]

5G is the next major face of Mobile communication providing us with the wireless system. It has more capacity,with the extended speed of **1Gbps**,

- Providing a more reliable and fast atmosphere then 4G, with minimum cost as compared to the previous generations offered to the user.
- IPv6, is invested in this, where a care for Mobile IP addresses are a sign, in respect to their locations as well as the networks they are connected to, with a concurrent data transfer paths.
- These are by-directional systems consisting of larger bandwidth with lesser traffic.
- They roam around with the connectivity speed of 20.5Mbps, which provides enhanced and flexible connectivity around the world giving us the mode of uploading as well as downloading speed.

It has for now, the best and the fastest resolution. They highly support virtual private networks providing the high-quality of services and policies maintained in order to maintain the security with supervision induced in the system for fast actions. [26]

Wireless technology works in the form of electromagnetic waves or signals send over the environment in earth's atmosphere. Work on the end-user format where electromagnetic signals are travelled from one access point of an antenna to another antenna or cellular network. 0s and 1s are occurring at the concept of whether if we are receiving the signals at a particular interval of time or when we are not receiving signals during that time. The digital bits used as 0s

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and 1s are transmitted to an electromagnetic signal, in microseconds. Such as:"sinus with face phase shifts" where time is inversely proportional to the bandwidth. The larger the bandwidth a signal consumes, the lesser the time it requires. Billions of these bits are transferred into long signal durations., such as, 01, 11, 10, 11 and so on, the way the sequence of bits' changes, the way the transmitting signals fluctuate over their environment. In the end, we will receive a signal. The transmitted Signal on the receiver side or at the end-user node, the received signal might look as distorted and noisy at the same time. The current need depends on how the signals are transmitted in the shorter duration of time with less of the noises and the pollution (distortion). 5G needed to be explained could be stated on various major technologies;

**2.1 Millimeter Waves**: [27]

The amount of devices we are operating today, all work under a particular range between 3 kHz-6GHz. Due to the increase in number of devices with a technology, this range is not able to produce those results which we are aiming for, as the population over this range is increased with increasing number of devices, it comes out with a spectrum ranging from 30 GHz-300 GHz apart from this particular range available earlier, these are the new Audit ranges., providing us with a new bandwidth, giving us the new powers. Apple and many large companies are experimenting their network from 28 GHz-39 GHz Spectrum. Although, there is one small limitations with millimeter waves, as it could not get pass by buildings or any obstacle present in the environment.

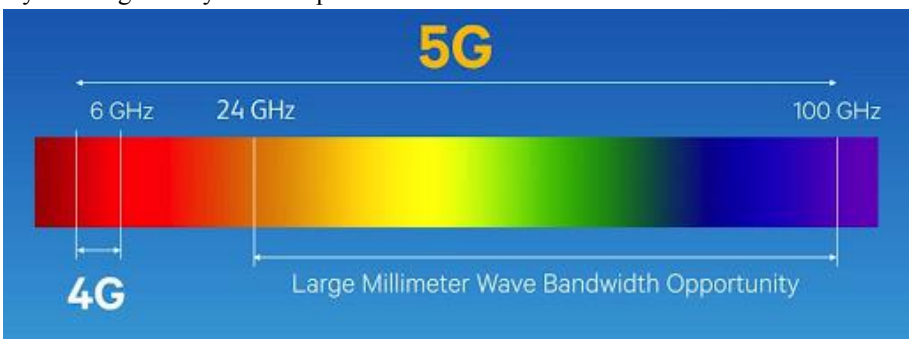


**Figure:** MM Wave in 5G. [28]

They have the loopholes where they are absorbed easily by clouds as well as plants. Hence,the need of another technology over this is required stating, Small cell networks.

**A. Small Cell Networks**

In our current scenario, the networks present in a mobile are being delivered by the high power cell tower which is maintained over the environment.

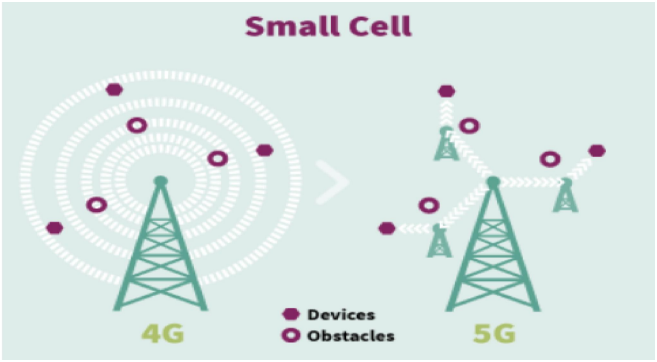


**Figure:** Small cell Network [29]

Thousands of smaller cell towers will be used for this future wireless technology as the signal which is generated by the high-power cell tower would not get lost in the middle of the path, due to some obstruction or obstacle., providing the boosted up signals and then the all-time available network signal within your individual devices.

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**B. Beam Forming**

Huge power's cell towers existing in today's environment have the ability to transfer the signals in all directions and thus they are being Omni-directional.

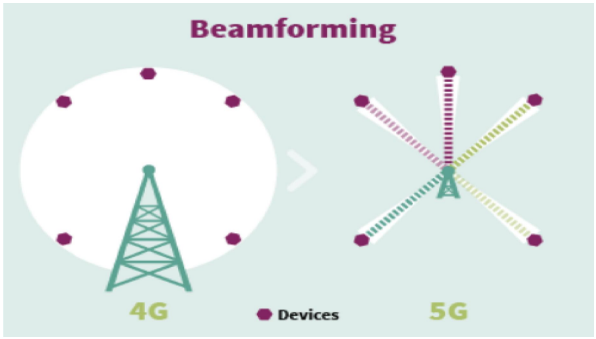


**Figure:** Beam forming Network

This provides a higher interface and availability of network and is not always uptight, as it could vary in providing sources. Beam forming technology redirect his energy towards the specific user signal,signaling them for the desired energy rather than transforming energy in an unprocessed and unscheduled way., resulting in a very efficient network and providing a proper strength to each individual without wasting any of the energies into the atmosphere.

One of the basic question arises that how a 5G technology could handle thousand times more data as compare to the 4G LTE. It could be explained as it could increase the data traffic for a particular area bit/s/km$^2$, which provides thousand time more traffic per area.

Within a network traffic of data, it is formulated in terms of

**Capacity = cell density. Spectral efficiency. available spectrum.**

These three different factors are the reason for the 5G technology to enhance 1000 times more than the current working network. If we multiply all these areas 10 times or 15 times more, will achieve that kind of power usage for that particular network.

**2.2 Higher Cell Density: [30]**

One of the way we are achieving 5G is through dividing the areas within particular amount of cells, multiple areas converted into sub-multiple amounts of cells which on combining together provides that particular area within the cellular network. Each cell consists of an access point which serves the user within that cell, transferring and receiving signals back and forth. Now we could say, the denser the cells are, the higher the density will be. Hence increasing the number of cell in that particular area, making it denser within the area, generating more cells, providing more with the access points in that particular cell, reducing the distance in the connectivity process which results in reducing the transmitted power over that area providing in saving the energy.

The only challenge arising in this kind of atmosphere is the interference of the potential substance, delivering the same amount of data within each cell will cause a little bit of interference problem arising in the environment.

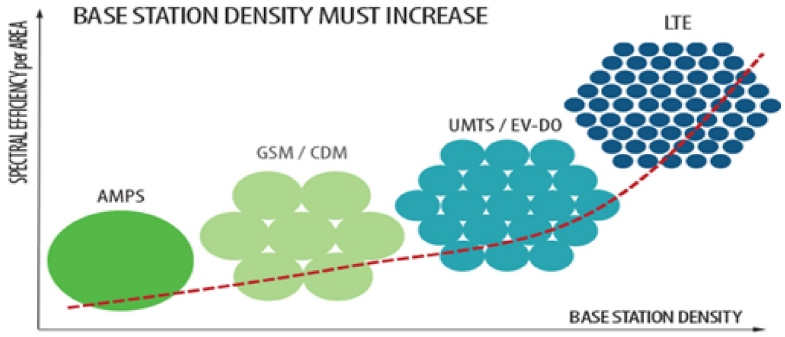


**Figure:** High cell density of 5G network. [31]

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### 2.3 Higher Spectral Efficiency

It is a kind of informational theory, providing us the way of conversation stating, how many bits could be directed per second or could be conveyed per second. In few cases, if we go further we would likely to experience, that after a while it will be a great challenge to improve the spectral efficiency beyond the channel capacity.

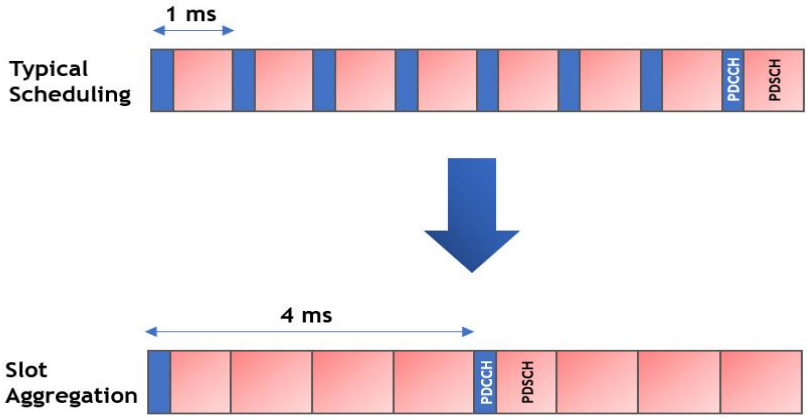


**Figure:** Spectral Efficiency in 5G [32]

By increasing the transmit power of the system one can increase its efficiency but it has one limitation that it is merely expensive to another level. It could work in certain conditions but if we want it in the long run for developing other network, it won't be a go to process. Hence, a solution over this has been occurred by establishing many of the stimulus transmissions in the areas, all drifted towards the users., providing more energy. We consist of an antenna radiating the signal in a particular manner, or to a particular direction till now, but as of from few years **MIMO** technology is used (multiple input multiple output) consisting of an antenna with multiple hundreds or 200 or 300 of smaller antennas within the system., which are redirecting the energy to that specific area to watch over the user and not in the other direction where these powers or signals are not required.

### 2.4 More Frequency Spectrum

We can state that the bandwidth is proportional to the number of times the transmission per second, more the spectrum would reduce the time per transmission over the system. With the extra spectrum provided to us in megahertz. This space, half of it has been already allocated to various technologies such as 580 MHz is allocated to the cellular department, 540 MHz for the Wi-Fi and so on. All of these allocations have been provided to lot of the resources in our system and many more are still to come. Much higher communication bandwidth is used which could be termed as millimeter wave as the wavelength lies around the millimeter balance. It consists of 30 GHz to 300 GHz [33]

These kind of atmosphere, the signal propagation becomes very difficult for such a short-range wavelength as it could not go through many of the objects or obstacles within the environment and hence designing and performing The new hardware will be required in this channel which can access on the huge bandwidth without providing any issues to the system.

Our main focus is towards 5G wireless networks, providing new connections to the industries, extending and providing higher throughput mobile broadband experiences. As 4G puts its main focus on people, places providing communication with information sharing as the basics of its infrastructure, 5G works over the same in an extended similar version with people, places and machines. 5G works on the three various use case scenarios with network becoming its key medium as stated above.

"5G system is being concerned over throughout the globe because of its high electromagnetic spectrum frequency, providing a harmful environment but scientist proves that even the use of the 5G frequencies are way below the harmful radiations such as UV rays, x-rays or gamma rays which are considered unsafe.5G provides with increase in battery range as it provides a network technology which is quicker than a battery technology. Enhancing and uploading speeds with the downloading are also a go to for the newer generations."

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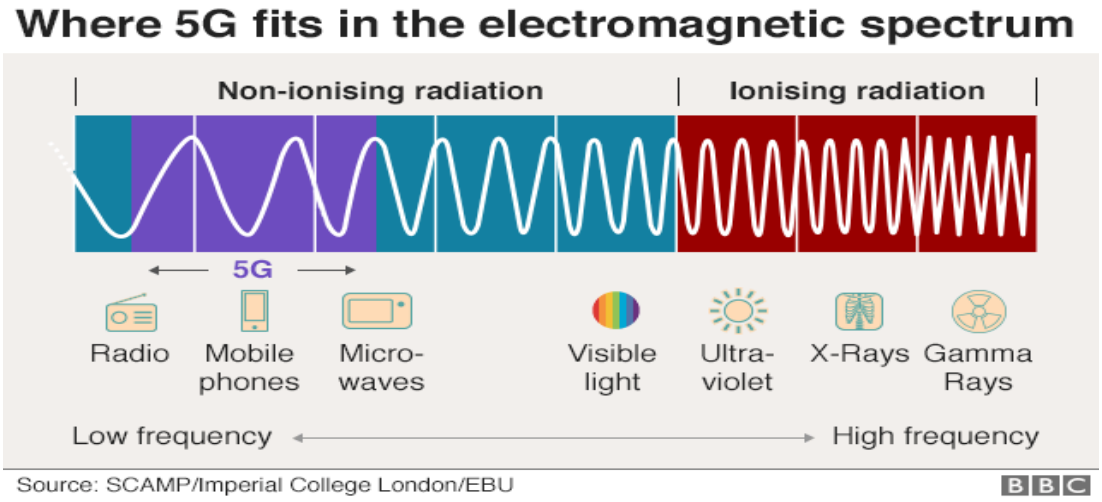


**Figure:** How 5G fits in Electromagnetic Spectrum [34]

In the processing of 5G, the hardware depicted:

- 5G hardware,
- Smart antenna,
- CDMA (code division multiple access),
- Ultra Wideband networks (UWB) which provides higher bandwidth at lower energy levels,
- Bandwidth provided of 4000 Mbps, which is according to be stated as 400 times faster than 4G wireless networks.

In the processing of 5G, the software depicted:

- Single unified standard for various wireless networks such as LAN technology,
- WWWW. (worldwide wireless Web),
- Unified IP address,
- LAN/WAN,
- Multiple combinations of broadband,
- Higher resolution is used over the phones, providing encryption and antivirus.

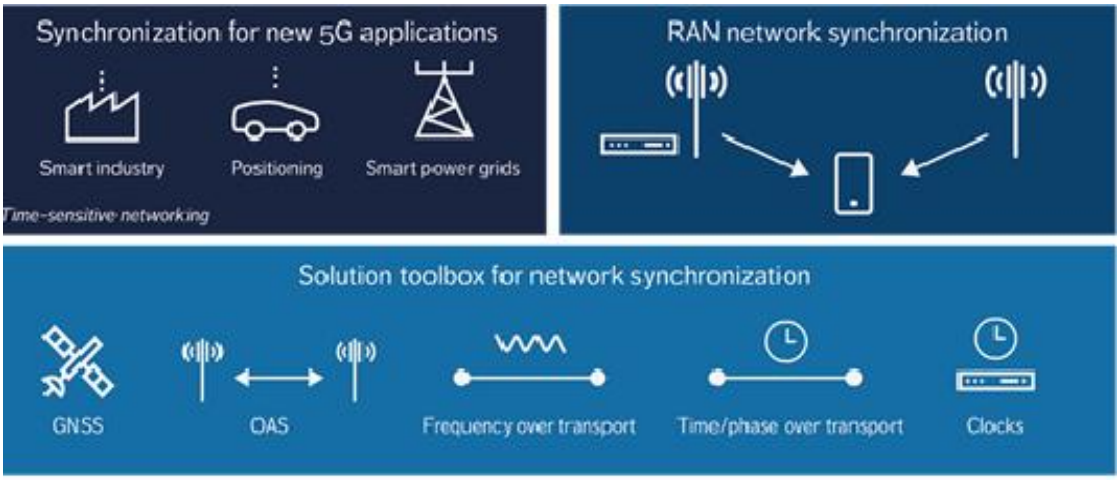


**Figure:** Synchronization in new network scenario [35]

Currently 5G is present at limited areas specified, AT&T5G are sitting in 160 cities of US. Once it has been shifted to more outer world and the restrictions of 2020 pandemic will be gone completely it again reaches its pace, being the centric network throughout the globe. The complete rollout of 5G could be seen in 2025. It is safe, fast and change the

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world which we are in.5G services are the levels which are maintained at the organizational level, giving us that sort of surety providing the management of traffic as well as safety measures to be taken, smarter retail and smart grid control needs to be access upon. With this comes few more technologies providing our world with a newer dimension such as:

- Quantum Computing parody relies on quantum phenomena of supersession and quantum entanglement. It played a heavy role in preventing the spread of the outgrowing pandemic of COVID-19. The ease with this kind of computing is it has a smooth way for creating, monitoring, analyzing as well as acting upon the data, independent of its sources.[36]
- Internet of things (IOT) or could be said as "intelligence of things" with most of the devices being AI enabled. The software and hardware applications within the IOT are meant to understand the complete learning of IOT, [37] one should focus on information security, artificial intelligence and machine learning, hardware interfacing, networking, business intelligence tools as well as UX/UI designs.
- Most of the work will be performed in a robotic manner in most of the cases this still needs to be manipulated by the people requiring human assistance or related via programming codes, which provides a clarity that it will only open new opportunities and new jobs and it won't make the humans unemployed.
- Fortinet, Cisco, Microsoft's, spunks are a few of the organizations with main focus over this emerging technology. Cyber security heavily depends upon malware analysis, coding skills, cloud security, IT and network fundamentals.
- DARQ [38] Is one of the new emerging technologies amongst all of these various technologies Corp, it is the collective combination of various emerging technologies such as quantum computing, artificial intelligence, extended reality and distributed ledger technology. The researchers believe that combining all of these technologies together would provide a huge impact on the future of our technological world.
- As a service: Google, Microsoft, Amazon are few of theorganizations, which are providing us with Edge technologies, accessible to everyone with little of the investment done. They are focused on server less computing which helps the user to work over the particular data or the product rather than maintaining and managing the environment.
- Hybrid cloud are also developing in order to meet the new technological aspects of the future and provide speed easy controlling power and more reliable security.
- Artificial intelligence [39] is a top front priority nowadays for various organizations, providing the machine learning algorithms to the next level understanding and performances which directly affects the users. It is estimated that direct connections and understanding the underlying analysis are the next important factors for our technologies, providing the authority is with a better understanding of the way the resources were used. Its main aim is to focus on the changing patterns of customer behavior and acting accordingly as well as detecting the ways by which they could satisfy their customers.

As computing as has been dropped earlier which could be explained as a distributed computing paradigm, bringing computation and data storage closer., saving bandwidth, increasing data response time, providing higher speed and security to the systems. It's all about the data. Popular providers of cloud such as Amazon and as you're has already started working over this project of H computing and soon it will be all over the market accessing its architecture.

## III. CONCLUSION

- Google assistant and Siri are one of the integral and smallest part of artificial intelligence.
- Digital fabrics are merged with VR gaming by various large organizations in order to feel vibrations, and the sensations (Hot or cold) while playing.
- Nanotechnology and Material Science has also been emerged as understanding the materials on the micro level, providing us with the new deliveries such as bendable screen as well as extended battery life.
- Cloud computing provides us the liberty of accessing the internet over some independent source or other organizations data center. This data provided over on the cloud could be accessed easily on the devices which

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are directly handled by the humans for their end connections. They made the computing on fingertips.

- Big data is also about revalued in the world full of data, data extraction with the help of intelligent algorithms are the new win-win, providing an augmented insight which has larger organizations.
- Entrepreneurs such as Richard Branson and Elon musk are getting ready in order to start their first space tours as for now it is being alarmingly expensive but with the present scenario we can say that by the next five years the cost of space store will be decreasing as the process becomes more advanced and available with just a click.
- 5G networks will be taking control of transportation flow system as well as a self-driving networks to improve the flow in the environment. They themselves contain vast amount of data
- Quantum computers provide chemical engineering concepts with maintaining biodegradable plastics, innovating new medicines, with building materials.
- 5G is the fifth generation mobile broadband innovated after 4G, long-term evolution, LTE. It focuses on improving the network connection will be a game changer over the communication aspect, providing a fast, stable and secure connection. It offers high-capacity and low latency to the systems. It affects various technologies such as artificial intelligence will be accessed throughout the globe and internet of things would be faster
- Driverless and flying cars are the new competitive environments which decreases human involvement completely, is one of the important task of AIS.
- The gasoline fuel will be out of the picture by the year 2025 as well as solar powered cars will emerge as the new power to the technology, which could be charged by the sunlight only.
- 5G Mobile Internet Connection, is the next common thing in the countries and cities which are technologically advanced. As of with 4Gs, it could take up to an hour to download a movie from the internet, within seconds 5G will complete the task, providing with the greatest connection speed with accessing all of the real-time broadcasting, such as it was done for sports in Olympics of 2018.
- Credit risk in banking as well as management could be taken care of Quantum technology, providing thousand times faster speed and access then the regular computers we are working in today's world. It is to be stated that by the end of 2029 the global market for quantum computing will be around $2.5 billion.
- 3G and 4G have bought internet to our homes, providing us with data driven services, giving us with the benefits of more bandwidth for streaming live channels. 5G services expected to completely revolutionize user's life by providing the services which relies over the advanced technologies such as AR and VR with gaming services operated by many companies and so on.
- IOT has provided a large economic stimulus, remote access of demand and have changed industry dynamics to a new level, effecting the healthcare sectors and higher manufacturing organizations with far better advancements.
- SAP, Siemens, IBM, Cisco are few of the organizations currently working on the IOT applications. By 2021 there will be a growth in 35 billion IOT devices installed worldwide with a drastic change to $75.44 billion by 2025.
- Cyber Security provide a better protecting atmosphere for small organizations, protecting the identities of the users and devices of remote workers, confidential records are maintained to be confidential by preventing the access to them as well as protecting smart supply chains.
- AR and VR will become the major roles on in the Department of healthcare. Interactivity also be increased in the educational sectors. By the end of 2021 video and gaming industry is expected to grow to $2.9 billion.
- DARQ relies mainly over the facts to maintain and improve labor productivity, enabling better experiences for the process and the cost should not be extending to another level. As it is being developing every alternate time period; very few organizations have invested in these kind of technologies.
- With "As-a-service model"; estimated that globally the market size of infrastructure as a service will be

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growing to $81 billion, platform-as-a service will be growing to $72 billion, and software-as a-service market will grow to $140.6 billion.

- Automation will be the next big model of coming technology within the next five years, providing the self-driving vehicles, priorities over civic authority is to be maintained by various organizations.
- Global economy of 2021 for AI will reach to dollar $57.6 billion.
- Organizations such as Verizon, T-Mobile, Apple, QuaLcomm, Nokia are highly working over creating the 5G technology cell applications. It is expected of 5G services to get launched within the year 2021 with basic 50 operators offering services wide over with 30 different countries

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