Introduction

- 5G is the fifth generation of cellular technology. It is a generational leap in technology where everything is new: new spectrum frequencies, new radio and new core network.

https://www.accenture.com/us-en/insights/5g-index

ICT Tools – Products and Services

***Enhanced Mobile Broadband*:** 5G technology provides faster download and upload speeds, allowing users to download large files in seconds and stream high-quality videos with minimal buffering.

Faster Data Transfer Speeds: 5G eMBB can provide data transfer speeds up to 10 times faster than 4G LTE, allowing users to download and upload large files in a matter of seconds.

Increased Bandwidth: 5G eMBB provides increased bandwidth, which means that more users can connect to the network simultaneously without experiencing slowdowns or congestion.

Improved Video Streaming: With 5G eMBB, users can stream high-quality video content without buffering or lag, providing a smoother and more enjoyable viewing experience.

Better Gaming: 5G eMBB can reduce latency, providing a better gaming experience for users by reducing delays and improving responsiveness.

Support for Emerging Technologies: 5G eMBB can support emerging technologies such as virtual and augmented reality, providing a more immersive experience for users.

Cons:

Limited Coverage: 5G eMBB requires a dense network of small cells to provide the necessary bandwidth and speed. This means that coverage may be limited in rural areas or other remote locations.

Increased Costs: Building and maintaining a 5G eMBB network is expensive, and those costs may be passed on to consumers in the form of higher prices for mobile data plans.

Compatibility Issues: Not all devices are compatible with 5G eMBB, which may require users to purchase new devices to take advantage of the improved speeds and bandwidth.

Security Concerns: As with any wireless network, there are concerns around security and privacy with 5G eMBB, especially as more users connect to the network and share sensitive information.

Electromagnetic Radiation: Some people are concerned about the potential health effects of electromagnetic radiation emitted by 5G eMBB equipment, although studies have found no conclusive evidence of harm.

Smart city services: 5G networks enable cities to implement advanced systems that can monitor traffic flow, optimize energy consumption, and improve public safety, among other things. These systems rely on real-time data and require a high-speed and low-latency network, which 5G can provide.

Pros:

Improved Efficiency: Smart city services can improve the efficiency of municipal services like waste management, traffic flow, and energy consumption, which can save time and money for both the city and its residents.

Better Quality of Life: Smart city services can improve the quality of life for residents by reducing traffic congestion, improving air quality, and providing better access to public services like healthcare and education.

Enhanced Public Safety: Smart city services like video surveillance and emergency response systems can improve public safety by providing faster response times and more accurate information.

Increased Sustainability: Smart city services can help reduce greenhouse gas emissions and increase energy efficiency, making cities more sustainable and reducing their impact on the environment.

Economic Growth: Smart city services can attract new businesses and industries to a city, creating jobs and contributing to economic growth.

Cons:

Privacy Concerns: Smart city services like video surveillance and data collection can raise privacy concerns, as they involve the collection and use of personal data.

Cost: Implementing smart city services can be expensive, and the cost may be passed on to residents in the form of taxes or fees.

Infrastructure Challenges: Implementing smart city services requires a robust and reliable infrastructure, which may be difficult to implement in older cities with outdated infrastructure.

Accessibility: Smart city services may not be accessible to all residents, particularly those who are elderly or low-income.

Security Risks: Smart city services are vulnerable to cyber attacks and other security risks, which could compromise personal data and public safety

Remote surgery, also known as telesurgery or telepresence surgery, is a medical procedure where a surgeon performs an operation from a remote location using robotic technology. Here are some of the pros and cons of remote surgery:

Remote Surgery: With 5G, doctors and surgeons can perform surgeries remotely, with the help of robots and high-quality video streams, enabling them to operate on patients who are located far away.

Pros:

Improved Access to Care: Remote surgery can provide access to specialized surgical care to patients in remote or underserved areas, allowing them to receive treatment without having to travel long distances.

Reduced Risk of Infection: With remote surgery, the surgeon does not need to be physically present in the operating room, reducing the risk of infection transmission.

Reduced Recovery Time: Remote surgery can result in smaller incisions and less tissue damage, leading to a faster recovery time for the patient.

Increased Precision: Robotic technology used in remote surgery can provide greater precision and accuracy during surgical procedures, reducing the risk of complications and improving outcomes.

Cost-Effective: Remote surgery can reduce the cost of healthcare by allowing surgeons to perform procedures from a remote location, reducing the need for travel and overhead costs associated with traditional surgery.

Cons:

Technical Challenges: Remote surgery requires a reliable and fast internet connection, as well as advanced robotics technology. Any technical failures or delays could have serious consequences for the patient.

Lack of Haptic Feedback: Surgeons performing remote surgery do not have direct physical contact with the patient, which can make it difficult to sense important feedback like tissue texture and temperature.

Legal and Regulatory Issues: Remote surgery raises legal and regulatory issues, as it may not be clear who is liable in the event of an adverse outcome.

Ethical Considerations: Remote surgery raises ethical questions around patient safety and the responsibility of the surgeon, particularly when it comes to decision-making in critical situations.

Limited Applicability: Remote surgery is currently limited to certain types of procedures and may not be appropriate for more complex surgeries

The Internet of Things (IoT) 5G enables a greater number of devices to connect to the internet simultaneously, allowing for the widespread deployment of IoT devices, such as smart home appliances, industrial sensors, and autonomous vehicles.

Pros:

Increased Efficiency: IoT can increase efficiency by automating processes and reducing the need for human intervention, resulting in cost savings and increased productivity.

Improved Communication: IoT devices can improve communication and collaboration between people and machines, enabling real-time data sharing and decision-making.

Enhanced Safety: IoT devices can improve safety by monitoring and predicting potential hazards, allowing for timely responses to prevent accidents.

Better Resource Management: IoT devices can improve resource management by monitoring and optimizing resource usage, such as energy and water consumption.

Personalization: IoT devices can offer personalized services and experiences to users, based on their behavior and preferences.

Cons:

Security Risks: IoT devices are vulnerable to cyber attacks and other security risks, as they are connected to the internet and exchange sensitive data.

Privacy Concerns: IoT devices collect and exchange data, raising privacy concerns around the use and storage of personal information.

Interoperability Issues: IoT devices from different manufacturers may not be compatible with each other, making it difficult to create a cohesive system.

Complexity: IoT systems can be complex, requiring expertise in multiple areas such as hardware, software, and data analytics.

Dependence on Technology: IoT devices may lead to a dependence on technology, making it difficult to perform tasks manually or without the use of devices

https://www.sdxcentral.com/5g/definitions/5g-vendors-around-globe/essential-5g-products/

Benefits:

- Speed Upgrades: Predicted speeds of up to 10 Gbps represent up to a 100x increase compared to 4G

Low Latency

- Latency measures how long a signal takes to go from its source to its receiver, and then back again. One of the goals for each wireless generation has been to reduce latency. New 5G networks will have even lower latency than 4G LTE.

Enhanced Capacity

- 5G will deliver up to 1,000x more capacity than 4G,3 creating fertile ground for IoT development

Increased Bandwidth

- The combination of increased speed and network capacity on 5G networks will create the potential for larger amounts of data to be transmitted than was possible with 4G LTE networks.

Availability and Coverage

- Today, all major US cellular carriers are deploying 5G networks in major cities as they prepare for wider rollouts.

https://www.intel.com/content/www/us/en/wireless-network/5g-benefits-features.html#:~:text=Emerging%205G%20networks%20feature%20lower,increased%20bandwidth%20compared%20to%204G.

Drawbacks:

- Technology is still under process and research on its viability is going on.
- The speed, this technology is claiming seems difficult to achieve (in future, it might be) because of the incompetent technological support in most parts of the world.
- Many of the old devices would not be competent to 5G, hence, all of them need to be replaced with new one — expensive deal.
- Developing infrastructure needs high cost.
- Security and privacy issue yet to be solved.

https://www.tutorialspoint.com/5g/5g_advantages_disadvantages.htm

Investigate the impact of 5G in the global economy

The impact of 5G on the global economy is expected to be significant, as it has the potential to drive innovation, increase productivity, and create new business opportunities. Here are some of the ways that 5G could impact the global economy:

Increased Productivity: 5G networks are expected to be significantly faster and more reliable than existing networks, which could lead to increased productivity in various industries. This could be particularly beneficial for businesses that rely on high-speed data transfer, such as manufacturing, transportation, and healthcare.

New Business Opportunities: 5G could create new business opportunities, particularly in the areas of virtual and augmented reality, autonomous vehicles, and smart cities. These emerging industries could create jobs and stimulate economic growth.

Improved Supply Chain Management: 5G could improve supply chain management by providing real-time data on inventory, shipments, and logistics. This could lead to more efficient supply chains, reduced waste, and cost savings for businesses.

Enhanced Innovation: 5G could drive innovation in various industries by enabling the development of new products and services that were not possible with existing networks. This could lead to increased competition, which could drive further innovation and growth.

International Trade: 5G could facilitate international trade by enabling faster and more reliable communication between businesses and countries. This could lead to increased trade volumes, which could benefit both developed and developing economies.

However, it is important to note that the full impact of 5G on the global economy may not be realized for several years, as it will take time for the technology to be fully deployed and for businesses to adapt and innovate to take advantage of it. Additionally, there may be challenges related to the cost of deploying and maintaining 5G infrastructure, as well as concerns related to data privacy and security https://www.google.com/search?q=impact+of+5g+proliferation+in+the+economy&oq=impact+of+5g+proliferation+in+the+econo&aqs=chrome.1.69i57j33i160l2.23292j0j9&sourceid=chrome&ie=UTF-8

https://www.pwc.com/gx/en/about/contribution-to-debate/world-economic-forum/the-impact-of-5g.html#:~:text=The%20key%20functional%20drivers%20of,5G%20global%20value%20chain%20alone.

Pros and Cons of different ICT products and services

5G modem – Signal Conversion, Speed, Cost, Automatic Dialing, Fax Compatibility

5G Radio Base Station