Network Managements System

What are the Fundamental elements of telecom ?

Solution :- Telecommunication systems rely on three basic elements working together:

1. Transmitter: This takes the information you want to send (voice, data, video) and converts it into a signal that can be transmitted over a distance.

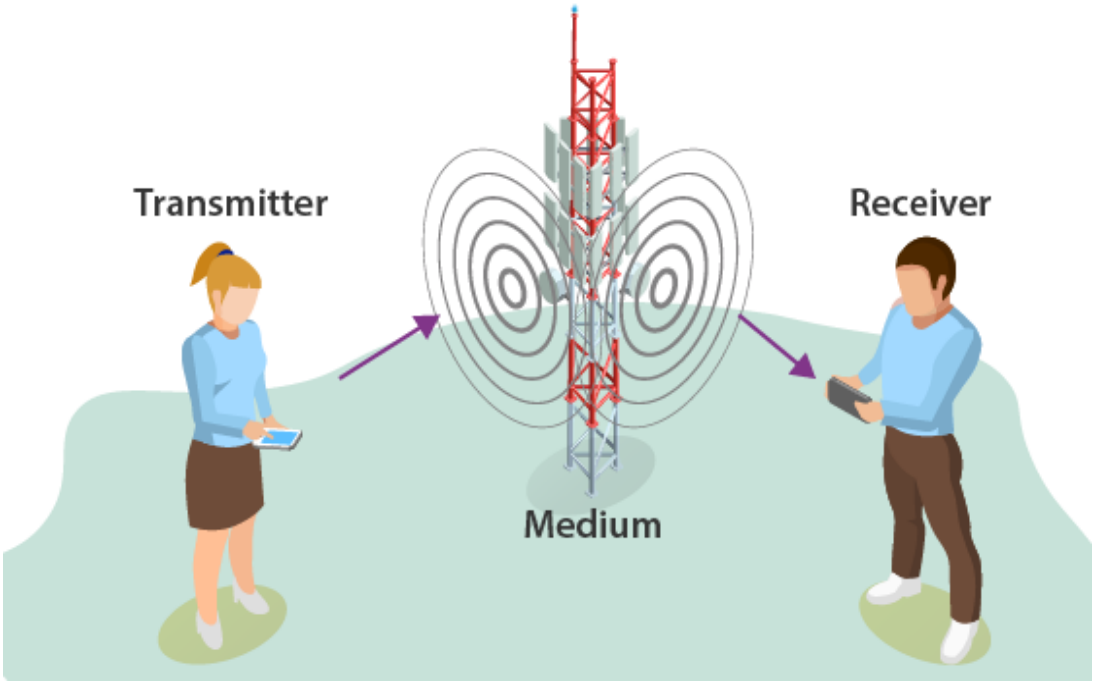
2. Transmission Medium: This is the path your signal travels on. It can be wired, like copper cables or fiber optic lines, or wireless, using radio waves or other electromagnetic waves.

3. Receiver: This receives the transmitted signal and converts it back into its original form, the information you want to receive.

These elements can be found in all sorts of telecommunication systems, from simple phone calls to complex internet connections.

In addition to these core elements, there are many other components that can be involved in a telecommunication network, such as:

- Switching systems: These direct your communication to the right recipient.
- Protocols: These are the rules that govern how data is formatted and transmitted.
- Communication channels: These are dedicated paths within a transmission medium for specific signals.



Network Managements System

The evolution of telecommunication ?

Solution :-

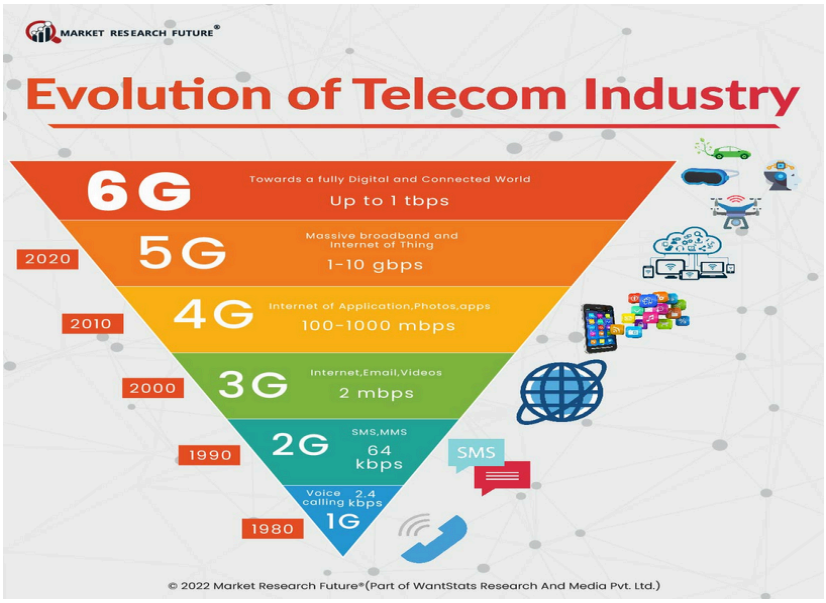
From Semaphores to Electrical Signals (1800s): Early communication relied on visual signals like semaphores or physical transportation of messages. The invention of the telegraph in the 1800s revolutionized things, transmitting electrical signals over wires for long distances.

Voice Takes Center Stage (Late 1800s-Early 1900s): The telephone's invention in the late 1800s allowed real-time voice communication, followed by radio waves enabling wireless telegraphy in the early 1900s. This era saw the rise of long-distance communication.

Cables and Satellites Expand Reach (Mid-1900s): The development of undersea cables and communication satellites in the mid-1900s dramatically increased global connectivity. This period also saw the introduction of the first commercial television broadcasts.

Digital Revolution and Mobility (Late 1900s-Early 2000s): The shift to digital signals in the late 1900s paved the way for faster data transmission and the rise of the internet. Mobile phones became widespread, allowing voice and data communication on the go.

Convergence and The Information Age (2000s-Present): The 21st century is marked by convergence - voice, data, and video all travel on the same network. Smartphones with high-speed internet access, social media, and cloud computing define the information age, with constant connectivity and information sharing



What is 5G NSA network architecture?

Solution :- NSA, which stands for Non-Standalone, is one of the two main architectures for deploying 5G networks. It acts as a stepping stone to full 5G functionality by leveraging existing 4G infrastructure. Here's a breakdown of NSA 5G:

- **Core Functionality on 4G Core:** Unlike Standalone (SA) 5G that uses a completely new 5G core network, NSA relies on the existing 4G core network (EPC) to handle tasks like call control and user data management.
- **Dual Connectivity:** NSA enables devices to connect to both the new 5G NR (New Radio) access network and the existing 4G LTE network simultaneously. This allows users to experience the benefits of 5G speeds for data transfer while still having the reliability of 4G for control functions like signaling.
- **Phased Transition:** NSA offers a smoother and faster transition to 5G for service providers. They can leverage their existing 4G infrastructure, reducing upfront costs, while gradually deploying 5G NR base stations.

Here are some advantages of NSA 5G:

- **Faster Deployment:** Operators can launch 5G services quicker using existing infrastructure.
- **Cost-Effective:** Leverages existing investments in 4G networks.

However, NSA also has limitations:

- **Not Pure 5G:** It doesn't unlock the full potential of 5G features like ultra-low latency, which require a standalone 5G core.
- **More Complex Network Management:** Managing both 4G and 5G elements can add complexity.Overall, NSA 5G provides a pragmatic approach for operators to introduce 5G services while laying the groundwork for a full transition to Standalone 5G in the future