

# **Telecommunication and Communication Networks in Business with Physical Communication Channels and data Transmission**

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## **Abstract**

Telecommunication and communication networks are becoming essential in running a business.

**Key words:** *Management Information System, MIS, Information System, IS, Electronic Enterprise, Information Technology, IT, Business Information Systems, Electronic Enterprise, Telecommunication and Communication Networks, Physical Communication.*

**Methodology:** System Analysis, Business Analysis, web search and books review.

## Introduction

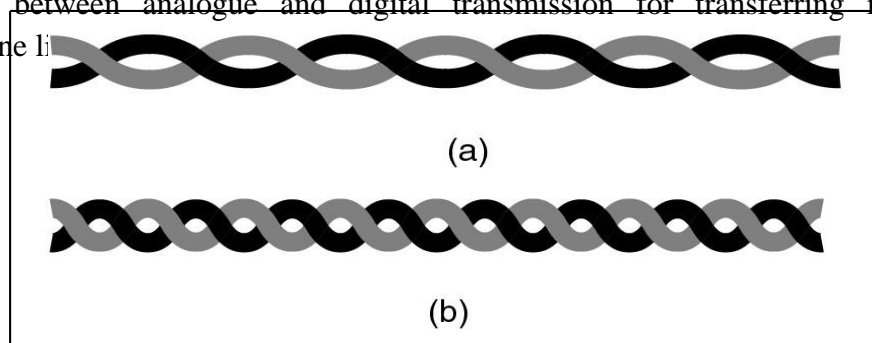
Traditionally, communications between business stakeholders including owners, management, supplier, employees and customers used to be based on the telephone system or postal services. Nowadays, high speed wired and wireless networks are used to support business communication to exchange data (voice, audio, text, etc.).

## Study structure

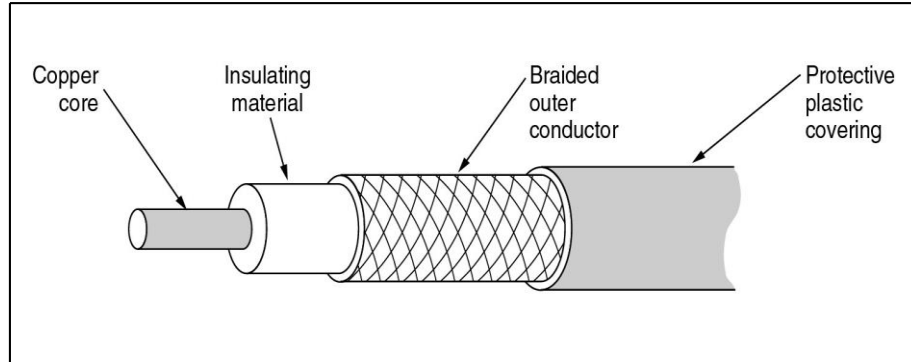
The vital role and importance of telecommunication systems are :Decreasing transaction cost, Decreasing agency cost, Increasing speed of work, High quality decisions and Declining geographical barriers.

Implementing Physical Communication Channels:

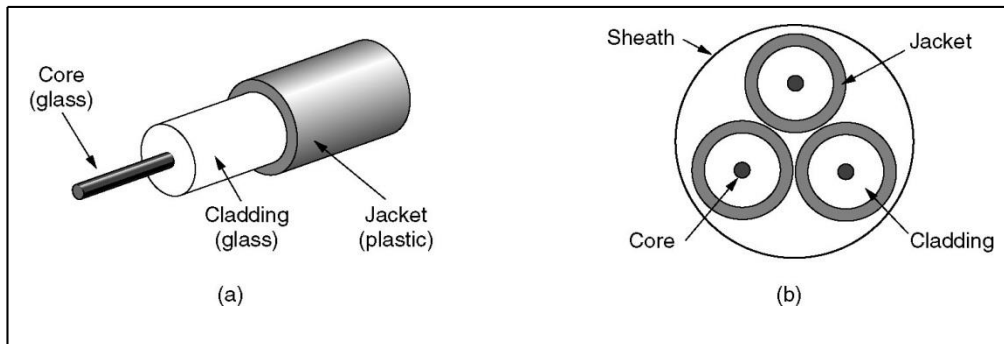
- Telephone Wires: It is very old and common transition media. It is a couple of covered wires called Twisted Pair. The speed of this transmission media ranges from (100-300) KB/s. The disadvantage of Telephone wires are they designed to transmit only analogue signals and that required a devices (Modems) to change back and forth signals between analogue and digital transmission for transferring it through telephone li



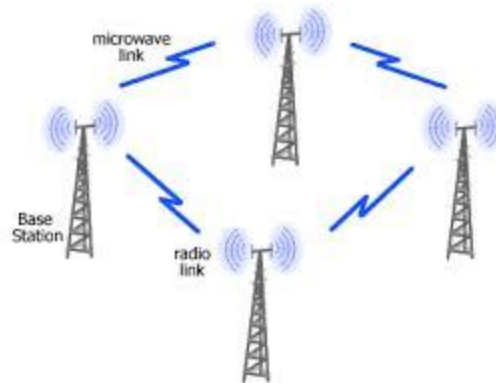
- **Coaxial Cables:** It is a single isolated cable considered as a high transmission speed compared with the telephone wires. It used to transmit data under the ground and seas. It couldn't be affected by electrical field and interruptions. It can transmit data to far distances. The main two types of coaxial cables are: baseband and Wideband. The baseband transfers digital signals in a high speed quality (1-50 million bits/s). It is cheap and easy maintenance. Wideband transfers multiple analogue signals (20-50 million bits/s) at the same time according to different fields of frequency.



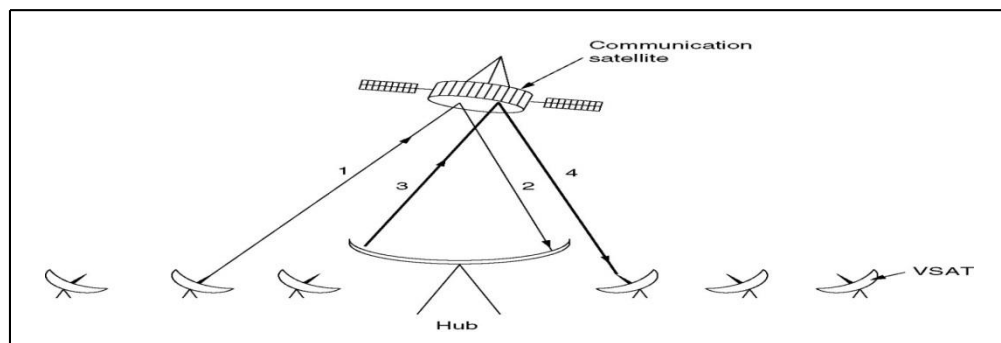
- **Fiber Optics:** In this media, Data are transferred in pulses of light not in electrical pulses as traditional transmission media. So the signals which are transmitted by fiber optics couldn't be interrupted in order to data interrupt. This media has a very high transmission capacity and is able to transmit data at higher speeds (billions bites/s) than other methods. Today, optical networks become more popular as a way to transmit multimedia files.



- Microwave: It is an electromagnetic waves with high frequencies used to transmit data in a very high speeds (up to 600+Mbps). Microwaves can transmit signals through open space as radio signals and television. The advantage of microwaves as a transmission media is the ability to transmit both analogue and digital signals efficiently. Microwave system is a sight line technology, so the signals will not pass through objects (mountains, buildings, airplanes, ...etc). This drawback limits microwave communication systems to line of sight operating distance.



- Satellites: It is a media that transmit data using orbital geostationary working as stations transmitting microwaves signals over a long distances through space. Satellite have been stationed in space and commonly used for mobile phone signals, weather tracking, or broadcasting television programs. It receive signals from an earth station and then retransmits the signal to other earth stations.



Data are transmitted based on two modes of transmission:

**Asynchronous Transmission:** A process where transmitted data is encoded with start and stop bits, specifying the beginning and end of each character.

**Synchronous Transmission:** Is a data transfer method in which a continuous stream of data signals is accompanied by timing signals (generated by an electronic clock) to confirm that the transmitter and the receiver are in step (synchronized) with one another. The data is sent in blocks (called frames or packets) spaced by fixed time intervals.

There are three directional modes of travel in data transmission:

**Simplex Transmission:** It is a mode in which data are transferred in one way flow direction only from the central processing unit to the terminals or vice versa.

**Half-Duplex Transmission:** This mode allows data to be transferred in two way flow directions, but doesn't allow data following from both terminals at the same time.

**Full-Duplex Transmission:** This mode allows data to be transferred from both terminals at the same time. Each terminal can transmit and receive data at same time, for example, as in telephone use.

**Conclusion:** We are using different way to communicate with each other's based on the channel we will find the speed.

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