

# Business Information System

## Unit – 3 Communication, Decision Making & Information System

By: Vibhuti Patel,  
Priya Patel  
PICA – BCA

# Basic Communication Concepts

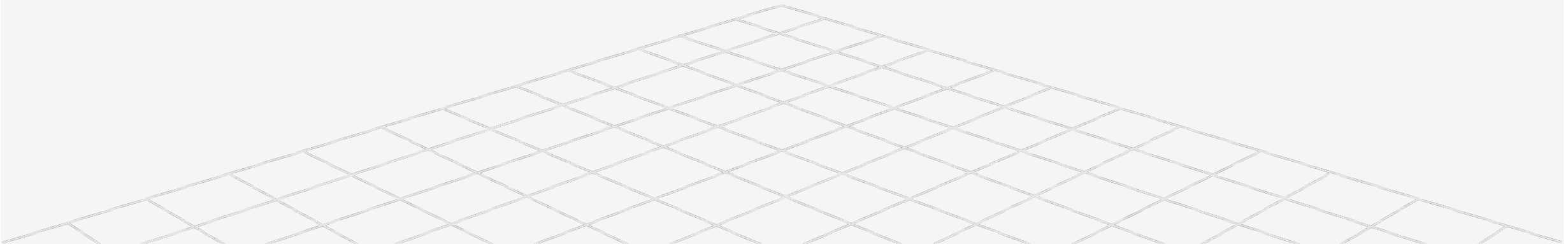
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- The transmission of data from one computer to another, or from one device to another.
- A communications device, therefore, is any machine that assists data transmission. For example, modems, cables, and ports are all communications devices.
- **Sender:** It is individual who initiates a message and is also called the communicator or source of communication.
- **Receiver:** It is a listener, reader, or observer – that is, the individual (or the group of individuals) to whom a message is directed.

# Basic Communication Concepts

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- **Message:** A message is defined as information conveyed by words (in speech or writing), and/or other signs and symbols.
- **Medium:** A medium is a channel or system of communication—the means by which information (the message) is transmitted between a speaker or writer (the sender) and an audience (the receiver).



# Basic Communication Concepts

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**Telecommunication:** It is the transmission of signs, signals, messages, words, writings, images and sounds or information of any nature by wire, radio, optical or other electromagnetic systems.

Telecommunication occurs when the exchange of information between communication participants includes the use of technology.

**Data Communication:** It is the transfer of data over a point-to-point or point-to-multipoint communication channel.

Examples of such channels are copper wires, optical fibers, wireless communication channels, storage media and computer buses.



# Data Communication Concepts

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The effectiveness of data communication depends on the four characteristics:

- Data must be received by intended device
- System must deliver data accurately
- Data must be delivered timely (no delay)
- No Jitter in delivered data i.e (if some packet arrive early they must be buffered)

**{Delivery, Accuracy, Timeliness, Jitter}**

# Components of Data Communication

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- Data
- Sender
- Receiver
- Transmission Medium
- Protocol



# Components of Data Communication

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**Data:** The message is the data or information to be communicated. It may consist of text, number, pictures, sound, video or any a combination of these.

**Sender:** Sender is a device that sends message. The message can consist of text, numbers, pictures etc. it is also called source or transmitter. Normally, computer is used as sender in information communication systems.

**Receiver:** Receiver is a device that receives message. It is also called sink. The receiver can be computer, printer or another computer related device. The receiver must be capable of accepting the message.

# Components of Data Communication

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**Transmission Medium:** Transmission Medium is the physical path that connects sender and receiver. It is used to transmit data. The medium can be a copper wire, a fiber optic cable, microwaves etc. it is also called communication channel.

**Protocol:** A protocol is nothing but a set of rules that applies on the full data communication procedure. This is like an agreement between the two devices to successfully communicate with each other.

For example, how the data will be sent, how the data will be traveling, how to ensure that full data has received, how to handle errors in transmission etc. Both devices follow the same set of rules or protocol so that they understand each other.



# Data Representation

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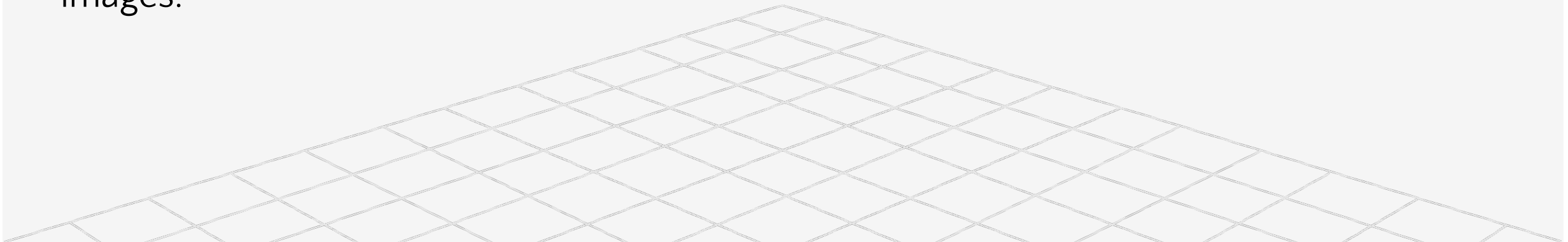
**Text:** A sequence of bits designed to represent text symbols.

**Numbers:** They are directly converted to binary form to simplify operations.

**Images:** composed of matrix of pixels

**Audio:** refers to recording or broadcasting of sound or music. It is represented by continuous electrical signals

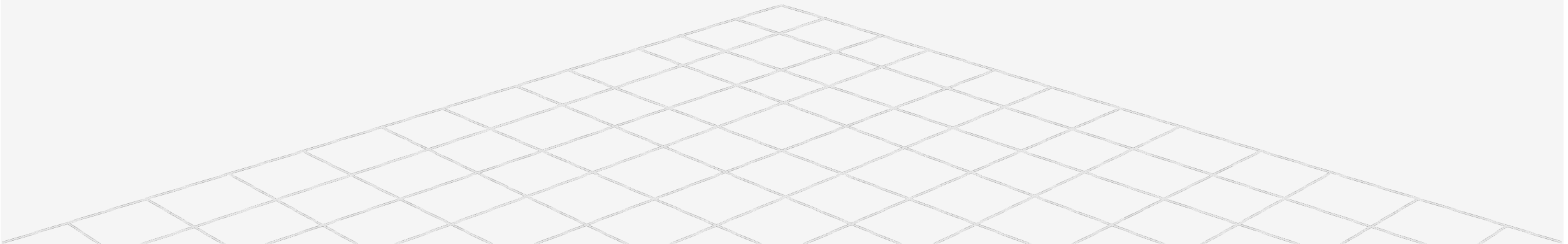
**Video:** refers to recording or broadcasting a picture or a movie. It can be a combination of images.



# Types of Transmission Mode

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- Simplex Mode
- Half-Duplex Mode
- Full-Duplex Mode

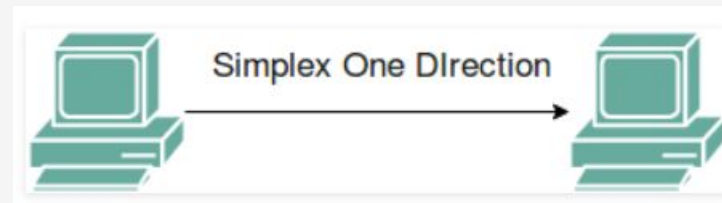


# Types of Transmission Mode

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**Simplex Mode:** In Simplex mode, the communication is unidirectional, as on a one-way street. Only one of the two devices on a link can transmit, the other can only receive. The simplex mode can use the entire capacity of the channel to send data in one direction.

Example: Keyboard and traditional monitors. The keyboard can only introduce input, the monitor can only give the output.

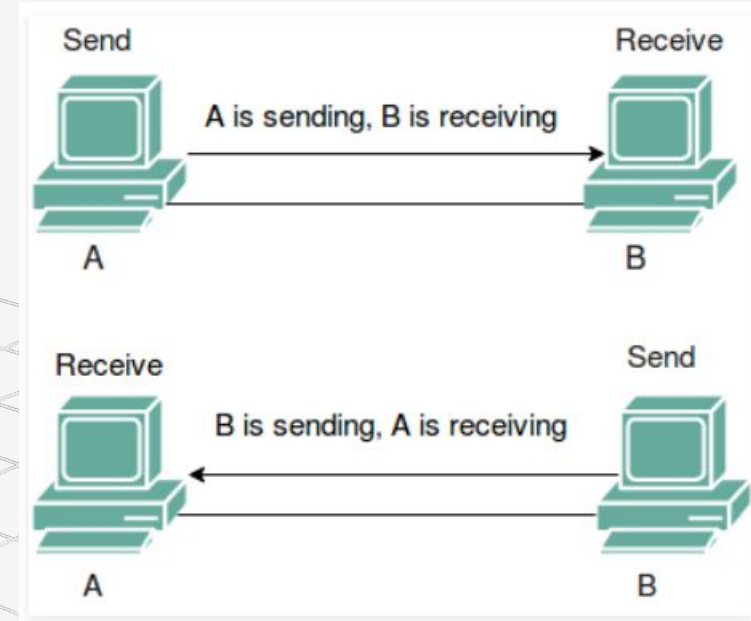


# Types of Transmission Mode

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**Half-Duplex Mode:** In this, each station can both transmit & receive, but not at the same time. When one device is sending, the other can only receive, and vice versa. The half-duplex mode is used in cases where there is no need for communication in both direction at same time. The entire capacity of channel can be utilized for each direction.

Example: Walkie – talkie in which message is sent one at a time and messages are sent in both the directions.



# Types of Transmission Mode

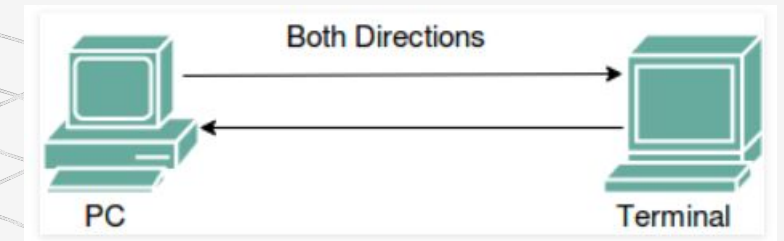
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**Full-Duplex Mode:** In full-duplex mode, both stations can transmit and receive simultaneously. In full duplex mode, signals going in one direction share the capacity of the link with signals going in other direction, this sharing can occur in two ways:

- Either the link must contain two physically separate transmission paths, one for sending and other for receiving.
- Or the capacity is divided between signals travelling in both directions.

Full-duplex mode is used when communication in both direction is required all the time. The capacity of the channel, however must be divided between the two directions.

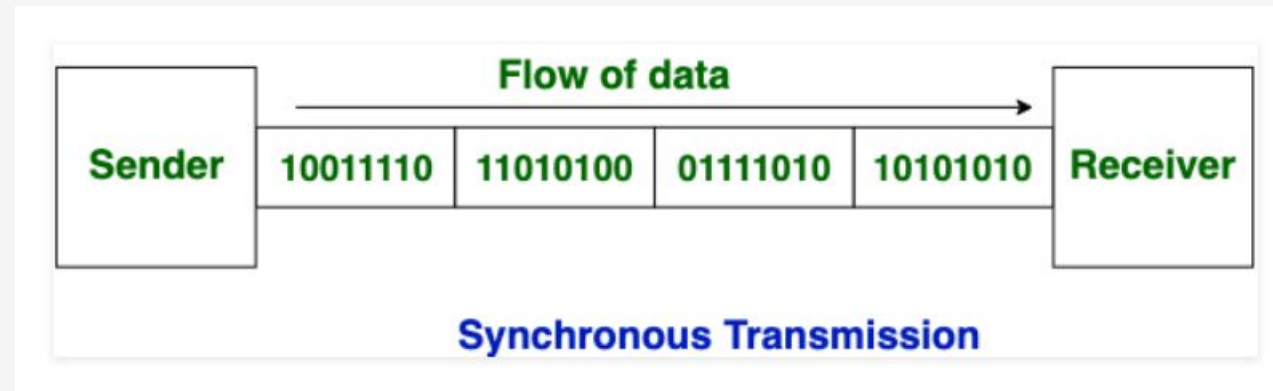
Example: Telephone Network in which there is communication between two persons by a telephone line, through which both can talk & listen at same time.



# Synchronous & Asynchronous Transmission

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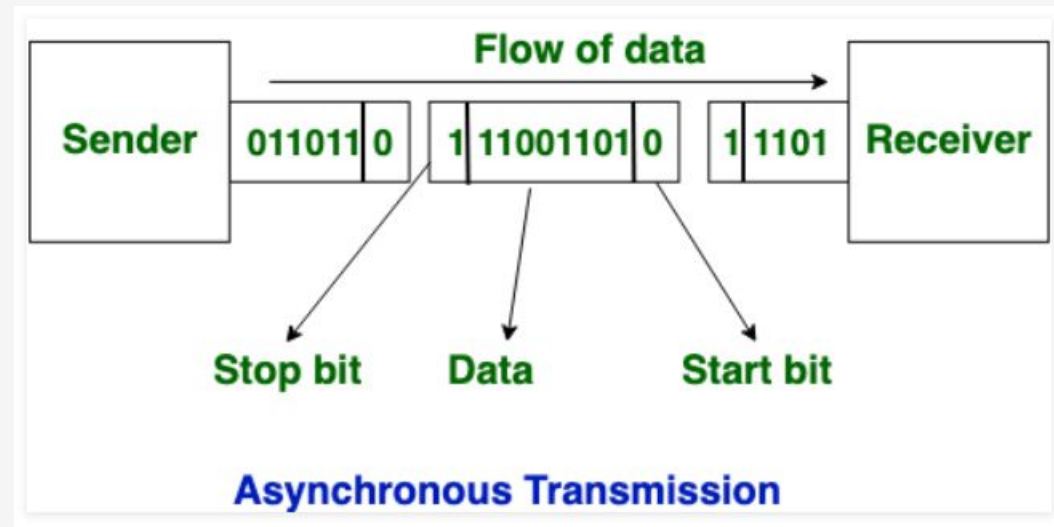
**Synchronous Transmission:** In Synchronous Transmission, data is sent in form of blocks or frames. This transmission is the full duplex type. Between sender and receiver the synchronization is compulsory. In Synchronous transmission, There is no gap present between data. It is more efficient and more reliable than asynchronous transmission to transfer the large amount of data.



# Synchronous & Asynchronous Transmission

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**Asynchronous Transmission:** In Asynchronous Transmission, data is sent in form of byte or character. This transmission is the half duplex type transmission. In this transmission start bits and stop bits are added with data. It does not require synchronization.



# Difference between Synchronous & Asynchronous Transmission

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| SYNCHRONOUS TRANSMISSION  | ASYNCHRONOUS TRANSMISSION  |
|---|--|
| In Synchronous transmission, Data is sent in form of blocks or frames.  | In asynchronous transmission, Data is sent in form of byte or character.                   |
| Synchronous transmission is fast.                                       | Asynchronous transmission is slow.   |
| Synchronous transmission is costly.                                     | Asynchronous transmission economical.  |
| In Synchronous transmission, time interval of transmission is constant. | In asynchronous transmission, time interval of transmission is not constant, it is random. |
| In Synchronous transmission, There is no gap present between data.      | In asynchronous transmission, There is present gap between data.                           |