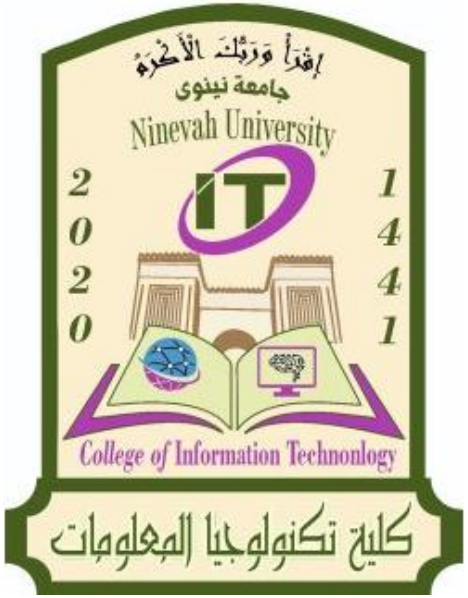


DATA COMMUNICATIONS

Lecture 1

Introduction

1-1 DATA COMMUNICATIONS

The term telecommunication means communication at a distance. The word data refers to information presented in whatever form is agreed upon by the parties creating and using the data. Data communications are the exchange of data between two devices via some form of transmission medium such as a wire cable.

Topics discussed in this section:

The effectiveness of a data communications
Components
Data Representation
Data Flow

The effectiveness of a data communications

The effectiveness of a data communications system depends on four fundamental characteristics

1. Delivery.
2. Accuracy.
3. Timeliness.
4. Jitter.

Delivery.

The system must deliver data to the correct destination. Data must be received by the intended device or user and only by that device or user.

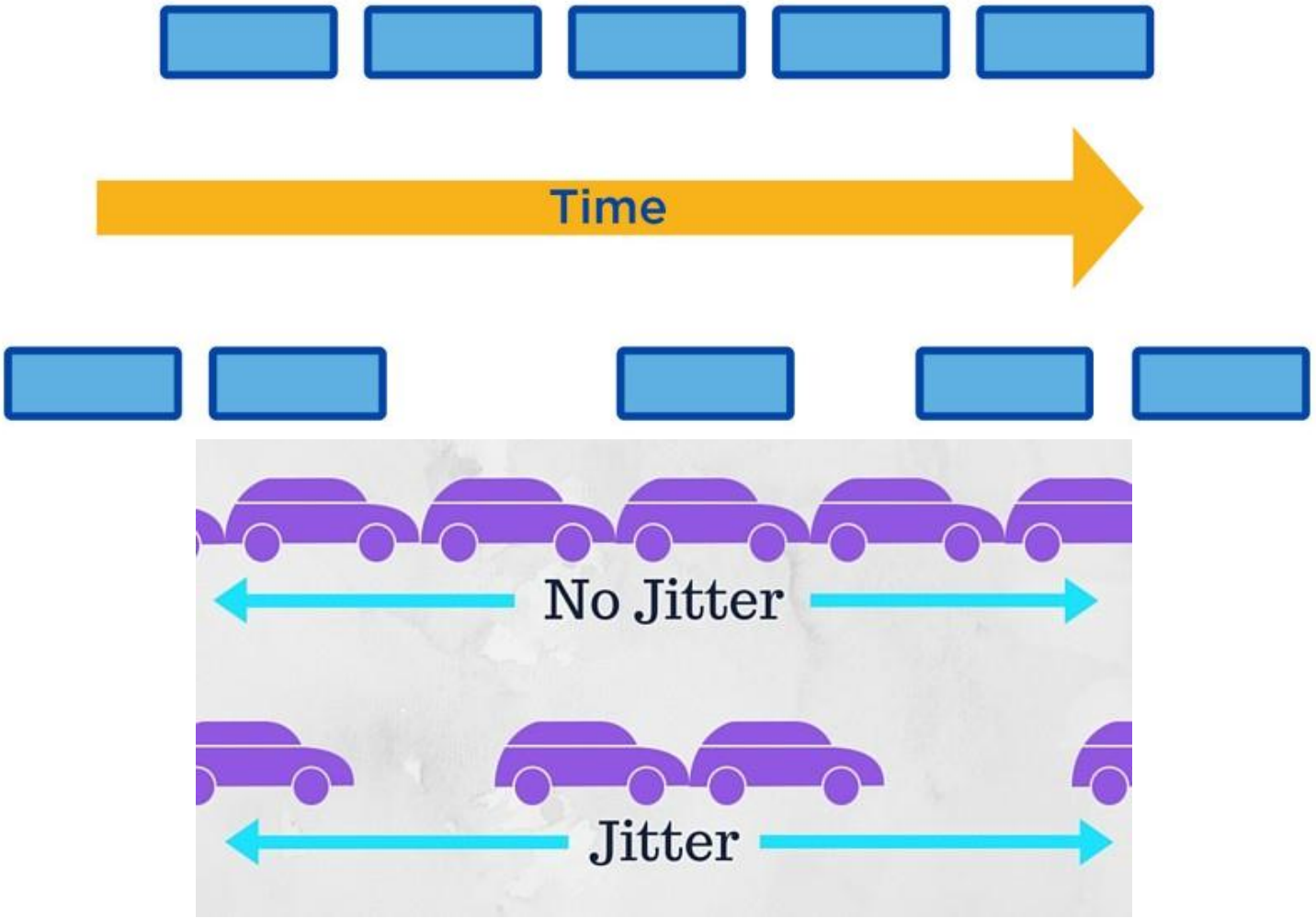
Accuracy.

The system must deliver the data accurately. Data that have been altered in transmission and left uncorrected are unusable.

Timeliness.

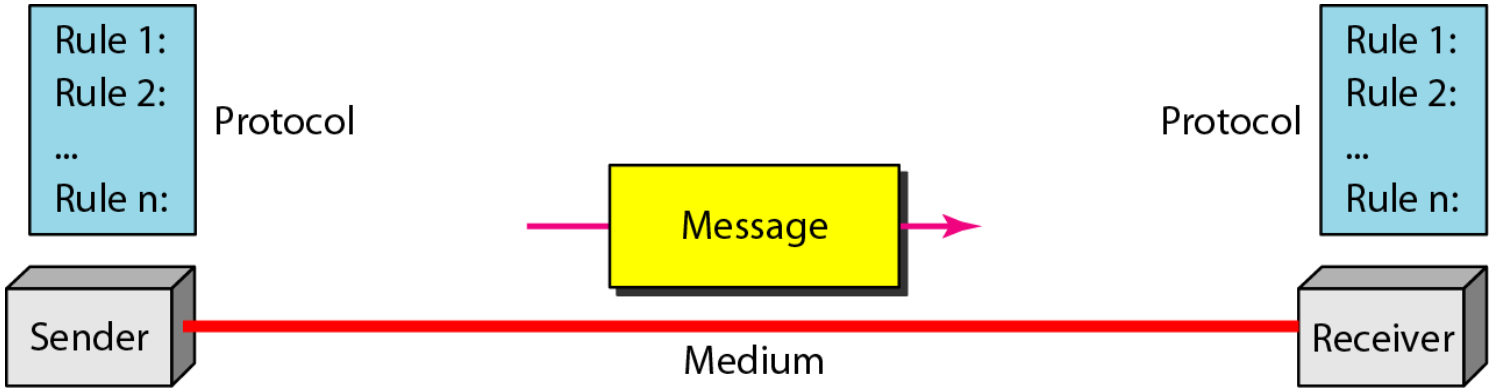
The system must deliver data in a timely manner. Data delivered late are useless. In the case of video and audio, timely delivery means delivering data as they are produced, in the same order that they are produced, and without significant delay. This kind of delivery is called *real-time* transmission.

Jitter



1-2 Data Communication Components

Five components of data communication



1.Message

The message is the information (data) to be communicated. Popular forms of information include text, numbers, pictures, audio, and video.

2.Sender

The sender is the device that sends the data message. It can be a computer, workstation, telephone handset, video camera.

3.Receiver

The receiver is the device that receives the message. It can be a computer, workstation, telephone handset, television.

4.Transmission medium

The transmission medium is the physical path by which a message travels from sender to receiver. Some examples of transmission media include twisted-pair wire, coaxial cable, fiber-optic cable, and radio waves.

5.Protocol

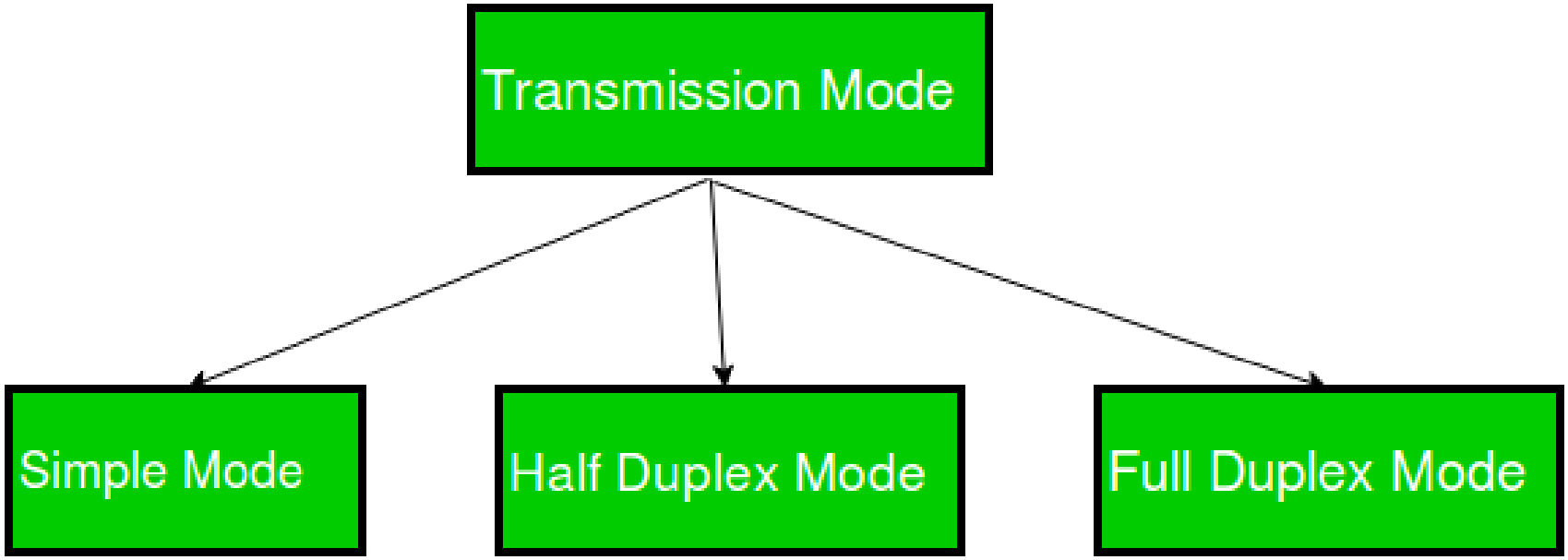
A protocol is a set of rules that govern data communications. It represents an agreement between the communicating devices. Without a protocol, two devices may be connected but not communicating, just as a person speaking French cannot be understood by a person who speaks only Japanese.

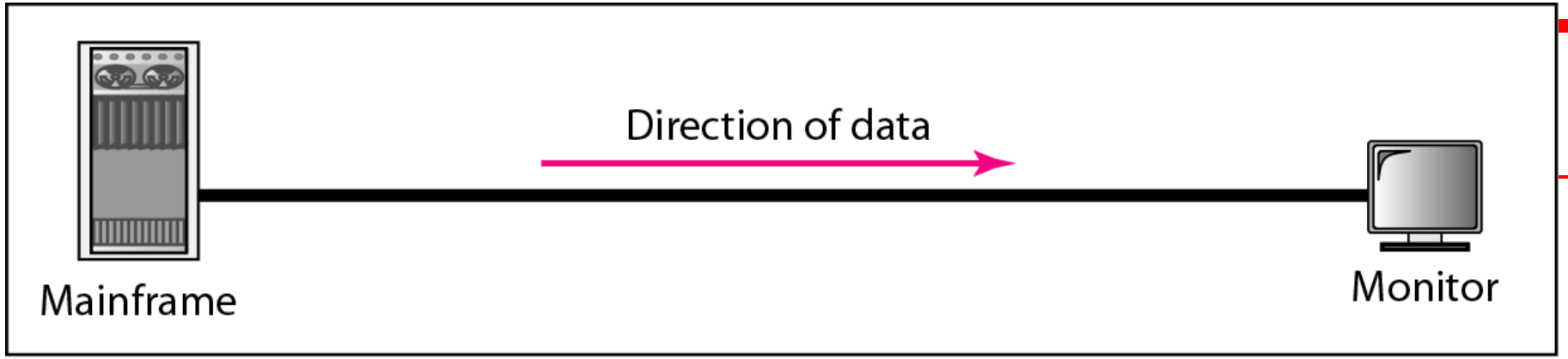
1-3 Data Representations

- *Images*
- *Audio*
- *Video*
- *Numbers*
- *Text (ASCII code)*

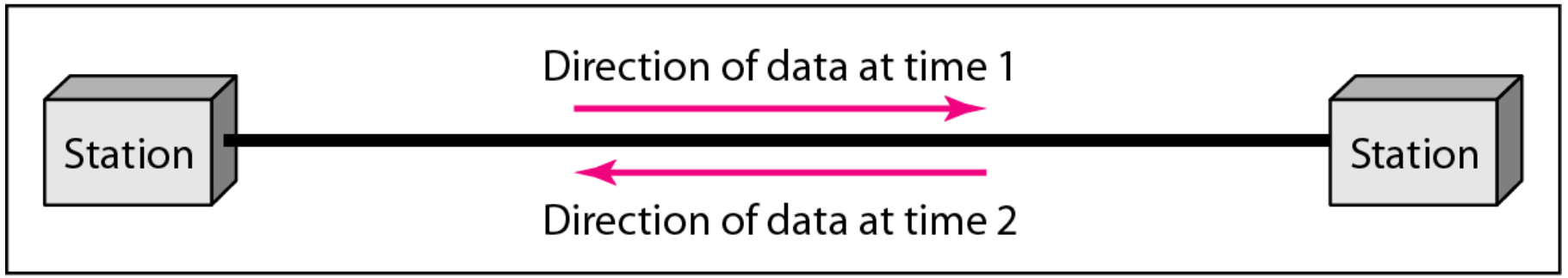
1.4 Data Flow

1. Simplex
2. half-duplex
3. full-duplex

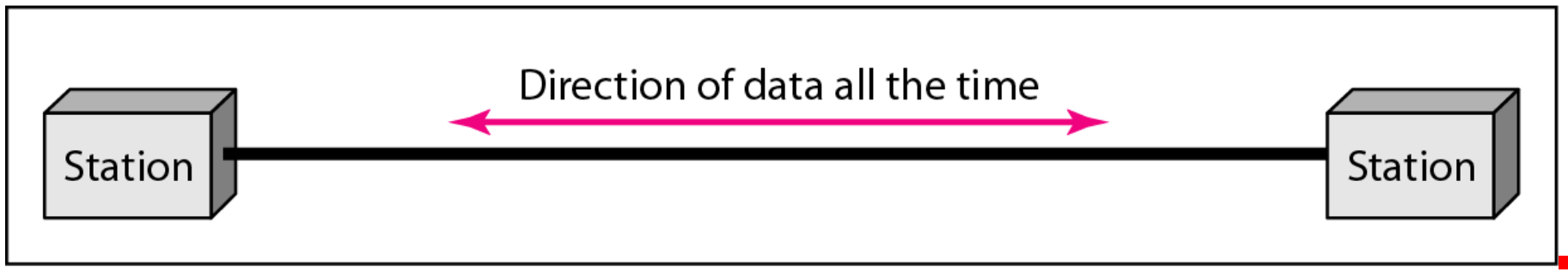




a. Simplex



b. Half-duplex



c. Full-duplex

Summary

- The effectiveness of a data communications: Delivery, Accuracy, Timeliness, Jitter.
- components of data communication: Message**,** Sender**,** Receiver**,** Transmission medium**,** Protocol**.**
- Data Representations: *Images, Audio, Video, Numbers, Text.*
- Data Flow (transmission mode): Simplex, half-duplex, full-duplex.