UKRIDA
Universitas Kristen Krida Wacana

Introduction

W1-M1

Sistem Telekomunikasi

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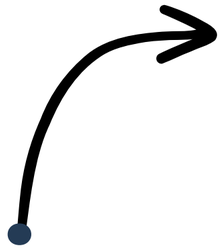
Learning Objectives

- Students understand the definition of a telecommunication system.
- Students know the components in a telecommunication system.
- Students understand the forms of communication.
- Students understand the various types of telecommunication network connections.
- Students are able to explain the role of data communication systems in the business world.

Definition

Telecommunication

- Exchange of information
- Transformation of the form of information
- Conversion of information into electrical signals



- Distance that can be covered
- Transmission speed
- Ease of being generated & converted into another form

- Information Source
- Transducer
- Amplifier
- Transmission Medium
- Information Receiver

Basic Components of a Telecommunication System

Terminal Equipment (TE)

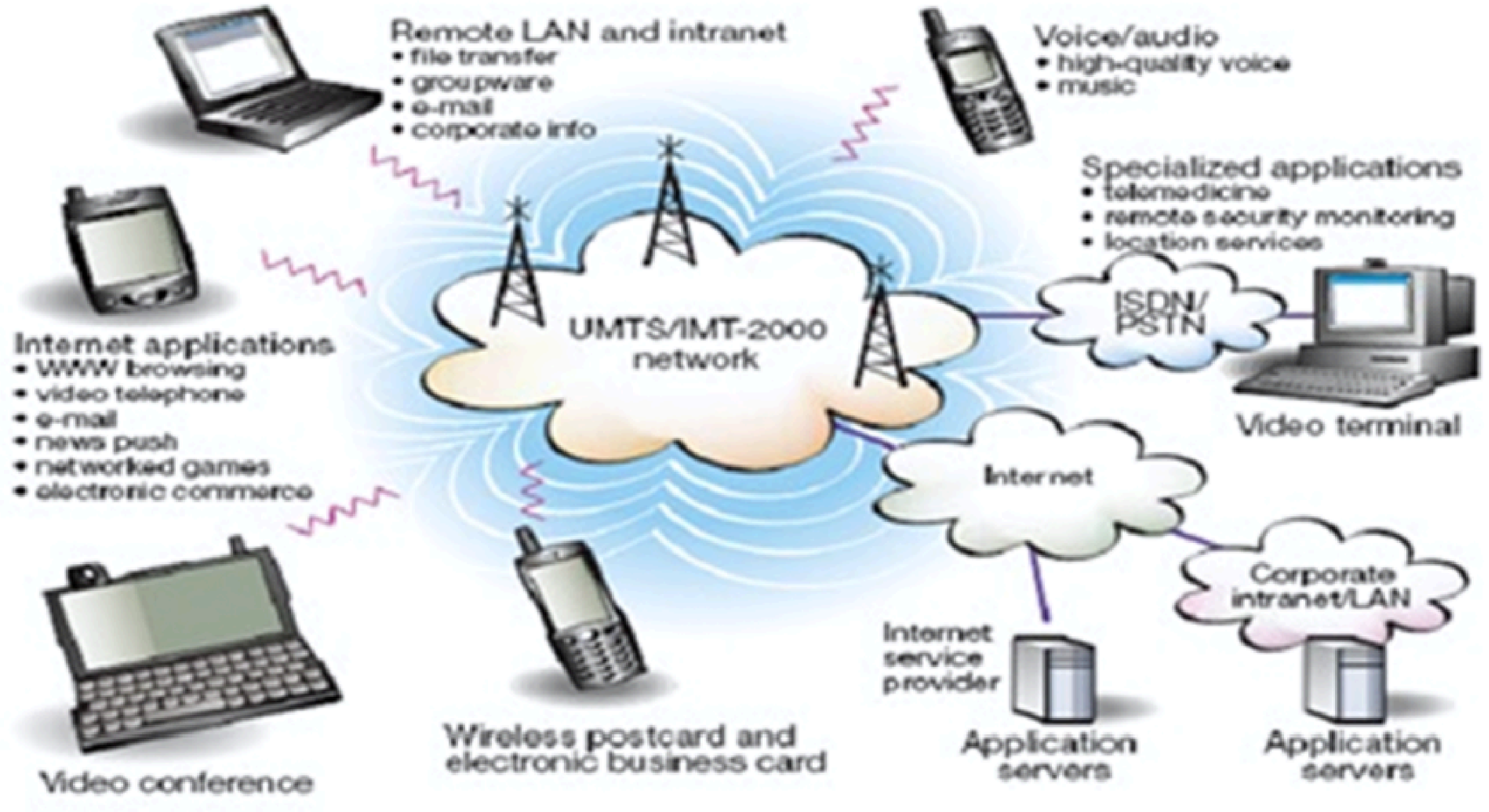
- Functions as an interface.
- Converts the form of information.
- Example: Telephone & Computer.

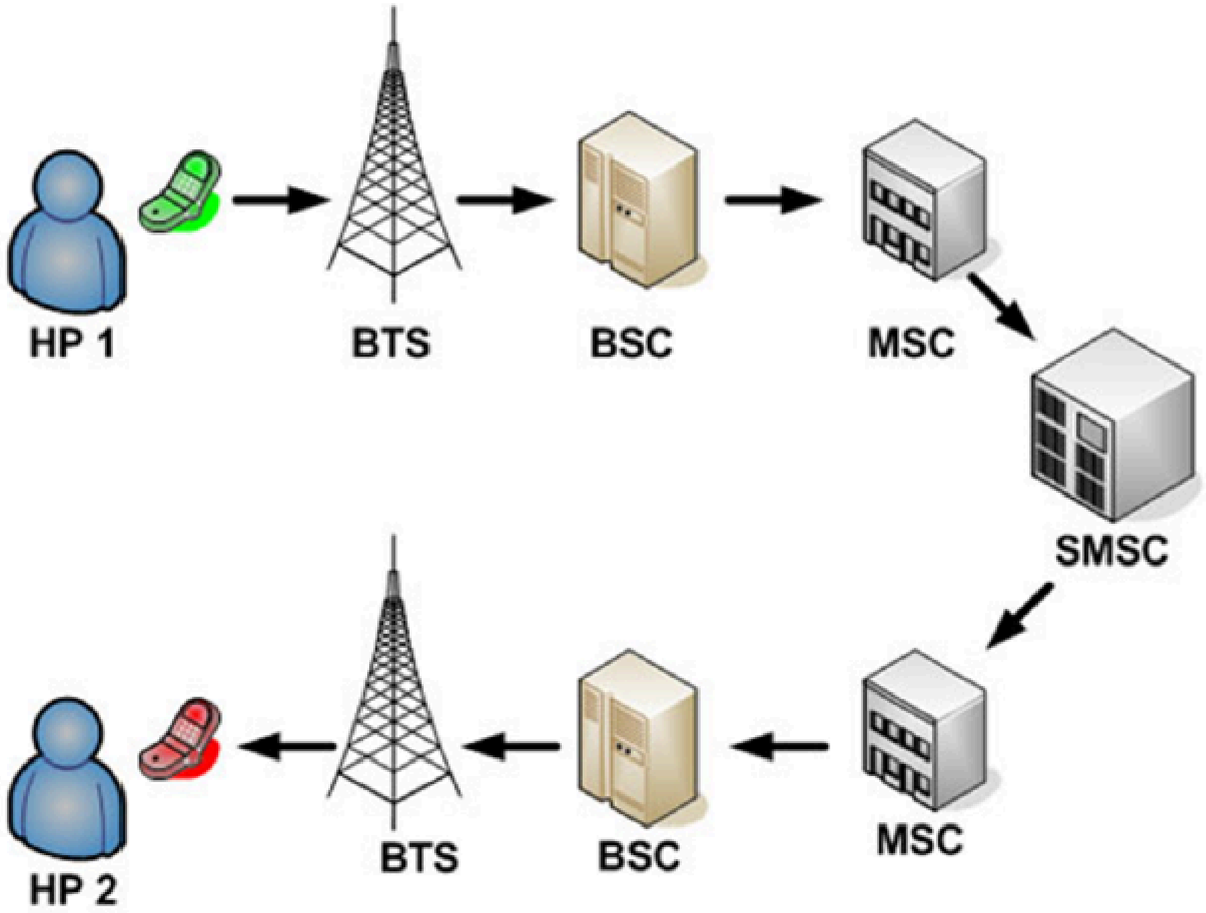
Switching Equipment (Central)

- Connector between channels in the telecommunication network.
- Determines the connection line between TEs.

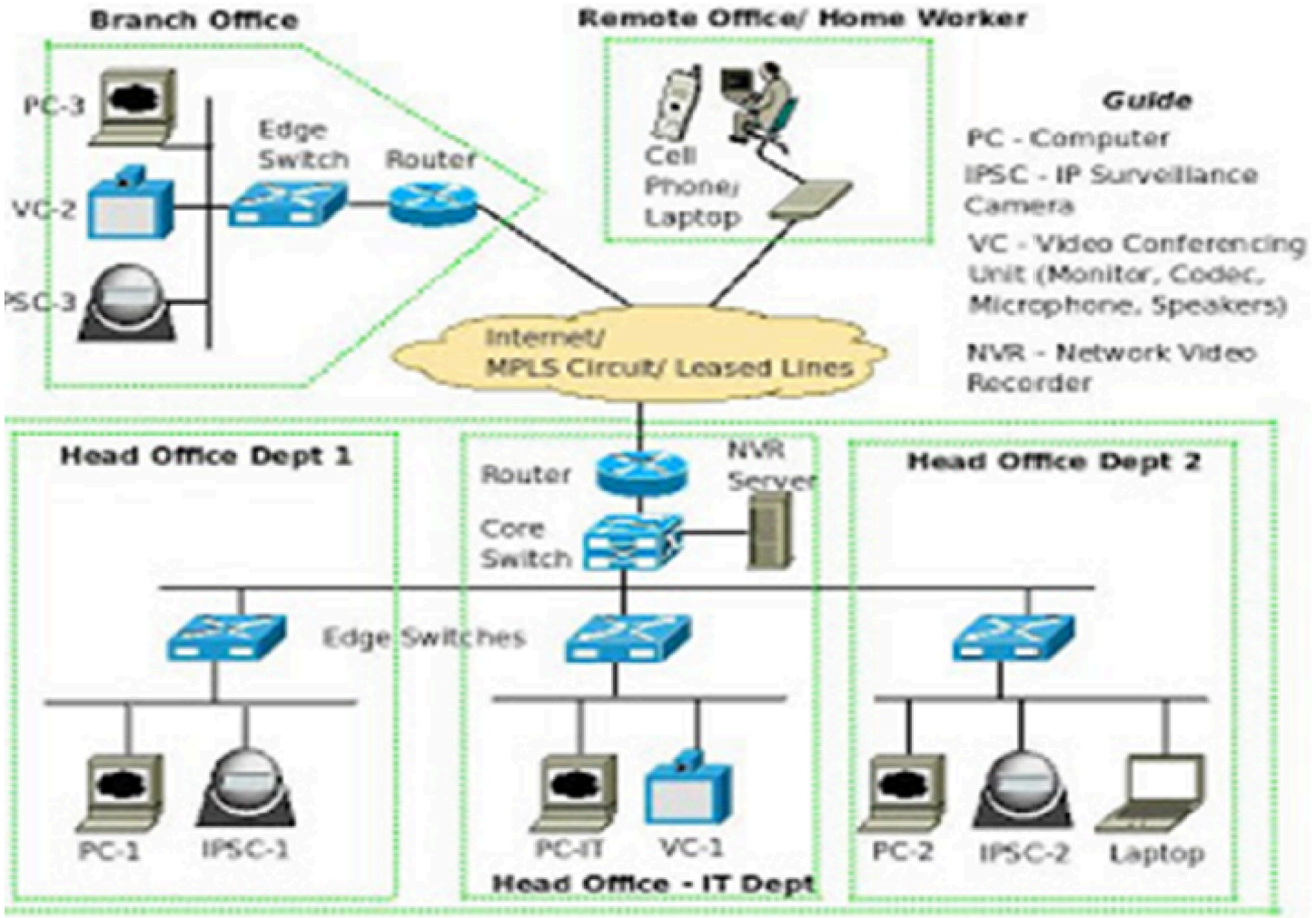
Transmission Line (Transmission Path)

- Connects between TEs, between centrals, and between central & TE.
- Example: Electromagnetic waves, copper cables, optical fiber.


Remote LAN and intranet
• file transfer
• groupware
• e-mail
• corporate info
Voice/audio
• high-quality voice
• music
Specialized applications
• telemedicine
• remote security monitoring
• location services
Internet applications
• WWW browsing
• video telephone
• e-mail
• news push
• networked games
• electronic commerce
UMTS/IMT-2000 network
ISDN/ PSTN
Video terminal
Internet
Corporate intranet/LAN
Internet service provider
Application servers
Application servers
Video conference
Wireless postcard and electronic business card



- BTS (Base Transceiver Station)
- BSC (Base Station Controller)
- MSC (Mobile Switching Center)
- SMSC (SMS Center)


Branch Office
PC-3
VC-2
IPSC-3
Edge Switch
Router
Remote Office/ Home Worker
Cell Phone/ Laptop
Guide
PC - Computer
IPSC - IP Surveillance Camera
VC - Video Conferencing Unit (Monitor, Codec, Microphone, Speakers)
NVR - Network Video Recorder
Internet/ MPLS Circuit/ Leased Lines
Head Office Dept 1
Router
NVR Server
Core Switch
Head Office Dept 2
Edge Switches
PC-1
IPSC-1
PC-IT
VC-1
Head Office - IT Dept
PC-2
IPSC-2
Laptop

Forms of Telecommunication

Based on the Type of Information

- Data Communication
- Voice Communication
- News & Image Communication

Based on the Method of Information Delivery

- Point-to-Point
- Point-to-Multipoint
- Multipoint-to-Multipoint
- Combination of Mesh & Star

Circuit Usage Methods

Dedicated Circuit

- A permanently established channel between the terminal and central terminal.
- Not dependent on whether data is being transmitted or not.
- Less efficient.
- More expensive cost.

Switched Circuit

- The channel is only established when data is going to be transmitted.
- The channel is disconnected when no data is being transmitted.
- Can serve more terminals.
- Higher channel usage efficiency.

Issues in Telecommunication Systems

Issues in Telecommunication Systems

Efficiency

Multiplexing

Response Time

Efficiency

Multiplexing

Factors to Consider in Building a Telecommunication System

- Signaling
- Transmission
- Numbering check
- Routing Method
- Tariff

Application of Data Communication Systems (KomDat) in Daily Life & Business World

Objectives of a Data Communication System

1. Efficient data transmission
2. Remote computer use
3. Centralization and decentralization
4. Simplify data management and organization
5. Reduce data processing time
6. Increase system reliability
7. Accelerate information dissemination

Circuit Usage Methods

Background

- The need for higher profits
- Changes in business models
- High level of competition

Objectives

- Improve customer service
- Achieve more competitive and responsive business operations
- Enhance data sharing and relationships between the head office and branch offices

Business Problems Solved by Implementing Data Communication Systems

1. Declining customer service quality.
2. Inaccurate data due to unrecorded transactions.
3. Delays in report generation for management.
4. Delays in decision-making and policy development.

Technical and Economic Considerations in Developing Data Communication Systems (KomDat) in the Business World

Type of transactions & their level of importance	⇄	Location & number of sites to be connected
Communication service tariffs	⇄	Expected future growth
Volume of data traffic	⇄	Distribution of data traffic
Programming language/system development language	⇄	Data reliability & accuracy

References

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Sandberg, B., “The Complete Reference Networking”, 3rd Edition, McGraw-Hill, 2015.

Ross, K., "Computer Networking A Top-Down Approach", 7th Edition, Pearson, 2017.

Thank you