Communication Channels

→ Communication Channels carry the data from one computer to another

→ Two categories; – Physical (Bağlantılar) Connections – Wireless Connections

∝ Twisted pair cable (Çift Bükümlü)
→ Slowest (En yavaş)
→ Consists of twisted pair cable
→ Telephone lines
→ Ethernet cables

∝ Coaxial cable (Anten)
→ 80 times transmission of twisted pair cable

∝ Fiber-optic cable
→ 26,000 times capacity of twisted pair cable
→ More reliable, less expensive than coaxial cable
(Daha az pahalı)

xx

→ Wireless connections do not use a solid substance to connect; uses the air itself

RF = Uses radio signals, smartphones and Internet enabled devices

WiFi = Wireless Fidelity communicates over short distances.

Bluetooth = Short range radio communication standard, 33 ft, Wireless headsets, Printer connections, hand held devices

WiMax = Microwave Access, allows greater than distances for Wi-Fi

Satellite; (Telecommunications) 22,000 miles above, U.S. government.   GPS → Network of 24 satellites

Connection Device Signals

→ Types of signals; Analog → Telephone signals; Continuous Electronic wave →

Digital → Computer signals; Presence or absence of an electronic pulse; on/off

→ Transfer Rate

UNIT	SPEED
Kbps	thousand bits per second
Mbps	millions bits per second

Gbps | billions bits per second

∝ Radio frequency (RF)
→ Wi-Fi (Wireless Fidelity)
→ Bluetooth (Short-Range)
→ WiMax (Extends Wi-fi) (Genişletilmiş Wi-fi)

∝ Microwave
→ uses high-frequency radio waves
→ provides line of sight communications, travel in a straight line → used for short distances

∝ Satellite
→ Global positioning system (GPS)

∝ Infrared (Kızılötesi)
→ Short distance and line of sight (Kısa Mesaje ve Görüş "sı")
→ Light waves → Sending and receiving devices must be in clear view of one another.

→ Computer communications is process of sharing data, programs and information btwn two or more computers

→ Numerous applications depend on communication systems, including
* e-mail
* Instant messaging
• Internet telephone
• Electronic commerce

→ Connectivity means you can connect your PC to other PCs and information sources almost anywhere

→ Connectivity uses computer networks to link people and resources
(Bağlanabilirlik) bilgisayar ağlarını kullanır.

Communication Systems

→ Electronic systems that transmit data from one location to another. (Veriyi bir yerden diğer yere taşıyan sistemdir.)

→ Communication systems can be wired or wireless. (Kablolu yada Kablosuz olabilir)

→ Four basic elements
∝ Sending and receiving devices (Gönderici ve Alıcı Aygıtlar)
* Computer or specialized communication device
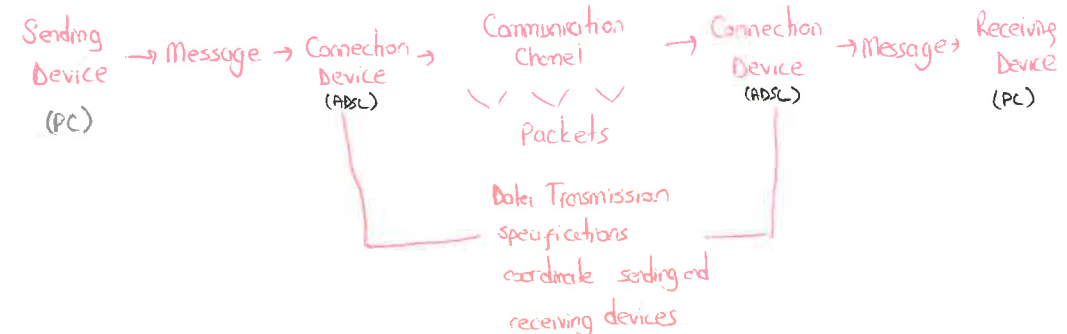∝ Communication channel (Haberleşme Kanalı)
* Carries the message
∝ Connection devices (Bağlantı Aygıtları)
* act as an interface btwn sending and receiving devices (Alıcı ve gönderici arasında bir arayüz gibi davranır)
∝ Data transmission specifications
∝ rules and procedures that coordinate the sending and receiving devices

Communication Systems

Sending Device (PC) → Message → Connection Device (ADSL) → Communication Channel → Connection Device (ADSL) → Message → Receiving Device (PC)

Packets

Data Transmission specifications coordinate sending and receiving devices

Bandwidth (Bant Genişliği)

→ Measurement of the width or capacity of the communication channel *(genişliği)*

α How much information can move across the communication channel in a given amount of time
(Belirli bir zamanda, haberleşme kanalından geçebilen bilgim miktarıdır.)

→ Categories ; α Voiceband (Ses Bant.)

* Low bandwith, standard phone lines

α Mediumband (connect minicomputers and mainframes) Over long distance, not individually

α Broadband (Geniş Bant)

High-quality ← * used for high-capacity transmissions (DSL, cable, satellite connections)

α Baseband (individually) (Taban Bant)

Protocols

→ Communication rules for exchanging data between computers *(alışveriş)*

→ Internet standard: TCP/IP (Transmission control protocol / Internet Protocol)

α Identification – unique IP adress (Kimlik)

α Packetization – info. broken down into small parts and then reassembled
(Bilgi küçük parçalara ayrıştırılır sonra tekrar birleştirilir)
(Paketleme)

URL ⟶ DNS ⟶ IP ADDRESS
www. __   65.29. _ _ _

Networks

→ A communication system that connects two or more computers

→ Allows exchange of info. and resources

Computer Networks

Node : Any device connected to a network (Düğüm) (Ağ)

Client : A node that requests and uses resources available from other nodes (İstemci)

Server : (Sunucu) * shares resources with other nodes; dedicated servers specialize in performing specific tasks – could be an app. server, comm. server, database server, file server, printer server, or web server

---

Connection Devices

→ Types of modems ;
→ Telephone modems — can be either internal or external
α Connects computer directly to a telephone line — connects computer directly to a telephone line

→ DSL (Digital Subscriber Line)
α Uses standard phone lines → External and uses either USB or ethernet

→ Cable modem
α Uses coaxial cable → Same as your TV, uses either USB or ethernet

α Wireless modem (WWAN)
α Does not use cables
α Signals are sent through the air
α Transfer speed or transfer rate (bits per second)
α The higher, the speed, the faster, the transfer rate
(Ne kadar yüksek hız, o kadar hızlı veri transferi)

Modem ;

Modulation: Process for converting from digital to analog
Demodulation: Process for converting from analog to digital

Connection Services

→ Digital subscriber line (DSL)
α Uses phone lines → provide high-speed connections, ADSL = Asymmetric Digital Subscriber Line

→ Cable (Telefon hattı kullanır)
α Uses existing TV cable (Mevcut TV kablosu kullanır)
α Faster than DSL

→ Satellite connection services
α Use almost anywhere (Uploading and Downloading)
α Slower than DSL and cable modem

→ Cellular Services (Hücresel)
α 3G and 4G cellular network connectivity

14

System Software

→ Operating System   → Utilities   → Device Drivers   → Language Translators

↳ Works with end users, application software, computer hardware

* w/out OS, computer would be useless

①Operating system :
(Software environment)
plot form

→ Manage resources

→ Provide user interface

→ Run applications

Functions of Operating System

→ Manage computer resources
- → Coordinate memory, processing, storage, printers and monitors
- → Monitor system performance
- → Schedule tasks
- → Start-up the computer

       → Provide security

→ Provides user interface
- → Character -Based Interface   → Graphical User Interface (GUI)

→ Runs applications
- → Multitasking   → Foreground and Background applications

Features of Operating System

→ Booting (Boslatma -Önyükleme)   → Icons, Pointer, Windows, Menus, Tabs, Help, Dialog Boxes

Optical Disks

→ Hold over 100 GB of data   → Using laser technology for burning

Attributes ; Lands (1 -reflection)   Pits (0 -no reflection)

Three types ; 1-) Compact Disc (CD)   2-) Digital Versatile Disc (DVD)

         3-) Blu-Ray (Hi-Def) Disc

1-) Compact Disc (CD)

→ Optical Format   → 650 MB to 1 GB   → Rotation speed vary

→ Read only (CD-ROM) → Write once (CD-R) → Rewriteable (CD-RW)

2-) Digital Versatile Disc (DVD)

→ Like CDs optical format   → 4.7 GB to 17 GB

→ Read only (DVD-ROM)   → Write once (DVD+R and DVD-R)

→ Rewriteable (DVD+RW , DVD-RW, and DVD-RAM)

3-) Blu-Ray (Hi-Def) Disc

→ 25 GB to 128 GB

Solid State Storage

→ Solid state drives (SSDs)   → No moving parts
            → Faster and more durable than hard disks

→ USB Drives (or Flash Drives)   → Connect to USB port

         → 1GB to 256 GB

Utilities (Yardımcı Uyg.)

→Troubleshooting or diagnostic programs   → Antivirus   → Uninstall

→Backup   →File compression

Windows Utilities ;—Backup and Restore   - Disk Cleanup   - Disk Defragmentor

System Unit ; Types: Desktop - Media Center - Notebook - Netbook - Tablet - Handheld

Components → ① Systemboard
↳ Motherboard
↳ Socket
↳ Bus Lines
↳ Expansion Slots

② → Microprocessor
③ → Memory

1-) Systemboard (Main Board, Motherboard)

→ Controls communication
→ Data path.

→ Components connect to the system board
(Sistem kartına bağlı bileşenleri kontrol eder)

Components;

Sockets : Provide a connection point for chips

Chips : α Mounted on carrier packages
α Etched onto squares of silicon
α Silicon chip, semiconductor, integrated circuit

Slots : Provide a connection point for specialized cards or circuit boards

Bus Lines : Provide pathways that support communication among the various electronic components

4-) DATA

→ Raw, unprocessed facts (Text, numbers, images, sounds)

→ Processed data becomes inf. (işlenen vei bilgiye dönüşür) By → Software

→ Digital data is stored electronically in files; Document F. - Worksheet F. - Database F.
Presentation F.

6-) Connectivity

- Sharing info. with other devices

Cloud Computing (Dropbox, Email, SkyDrive)

- Activities from a user's computer to computers on the Internet

Computer Hardware

Electronic Data : Data and instructions are represented electronically

→ Two-state system or Binary System

- Off - On.
- Characters; 0's and 1's
- Bit   . Nibble (Hexadecimal)   . Byte   . Word

Character Coding System

→ Binary coding system ;   ASCII → 7 bit   text - other characters

EBCDIC → 8 bit   character

Unicode → Large numbers of characters
∴ allows non-English ch. and special ch.

→ Computer Hardware ; System Unit
Input / Output Devices
Secondary Storage
Communication

1-) System Unit ; Components : 1) Microprocessor   2-) Memory

→ Holds data currently being processed (İşlenecek veriyi tutar).

→ Holds the processed info. before it is output. (işlenmiş veriyi çıktı olarak vermeden tutar)

→ Temporary storage, contents are lost when power is **off**

2-) Input /Output Devices ;   Input : Keyboard, Mouse

Output : Printer , Monitor

3-) Secondary Storage ; → Holds data and programs even if power is off

→ Hard disk

→ Solid-State Storage

∝ No moving parts

∝ More reliable

∝ Requires less power

∝ Flash memory cards, USB drivers

→ Optical Discs

∝ Laser tech.   ∝ Requires power   ∝ CDs, DVDs

u-) Communication ; Modems ; provide microcomputers with the ability to communicate with other computer systems.
- telephone, cable lines, air   (Sent-Received)

If 0 not important.

$$\lim_{x \to 0} \frac{\sin x}{x} = 1$$

$$// \; h = \frac{8}{3-1} = \frac{\frac{x}{x} - \frac{x}{3.\sin x}}{\frac{x}{8}} = \lim_{x \to 0} \frac{8x}{3.\sin x - x}$$

Information System : People, Hardware, Procedures, Data, Software, Connectivity (6)

Computer users : - Entertainment, Business, Medicine, Education

5-) Software : Program or programs

Step by step instructions that tell the computer how to do its work

Purpose is to convert data into information.

There are two software. System Software and Application Software.

1-) System Software ; a-) Operating System (İşletim Sistemi)

b-) Utilities (Sistem Araçları)

c-) Device Drivers (Aygıt Sürücüleri)

∝ Enables application software to interact with the computer hardware

∝ Background software helps manage resources

→ Operating System ; → Coordinates computer resources

→ Provides the user interface (arayüz)

→ Runs application

2-) Application Software ; End-user software

2 categorize ; Basic applications
Specialised applications

2-)
Hardware :

Types of Computers ; Supercomputers, Mainframe C. , Mini C. , Microc.,

Micro Computer Types ; Desktop, Media Center System, Notebook - Laptop, Netbooks, Tablet PC , Handheld C.

Microcomputer Hardware ; System Unit , Input /Output Devices
Secondary Storage , Communication

INPUT / OUTPUT DEVICES

→ Input ; devices translate data into a form that the system unit can process

→ Keyboards   → Mouse   → Pointing D.   → Scanning D.   → Image Capturing D.   → Audio - Input Dev.

→ Output ; Processed data or information

→ Monitors   → Printers   → Audio-output D.

SECONDARY STORAGE

Primary Storage

- Volatile storage
- Temporary storage
- Random Access Memory (RAM)
- Fast
- Expensive

Secondary Storage

- Non-volatile storage
- Permanent storage
- Slow
- Cheap

Hard Disks ; - Large capacity   - Internal and External

1) Internal Hard Disk

→ Located inside system unit and often designed as the C: drive

→ Used to store programs and data files

→ Advantages over removable media
  → Capacity
  → Access speed

2) External Hard Disk

→ Removable hard disks

→ Used to complement internal hard disk with an unlimited amount of additional storage

3. Flash Memory

→ Combination of the features of RAM and ROM

  can be updated   Non-volatile

→ Contains startup information ; - Amount of RAM
                                 - Type of keyboard, mouse and secondary storage devices connected

→ Expansion Slots and Cards ; - For adding devices   - Plug and Play (Tak-Çalıştır)

→ Bus lines ; - Pathway for bits
              Bus width ; Number of bits that can travel at once (Bir kerede geçen bit sayısı)
              1) System buses   2) Expansion Buses
                → Connect the CPU to other components on the system board.

USB (Universal Serial Bus)

∝ Connect external USB devices onto USB bus

Ports (Bağlantı)

→ Standard   → Specialized   → Legacy

Specialty Processors → Coprocessors (Ekişlemciler)

　　　　・Designed to improve specific computing operations

　　　　・Graphic coprocessors/ Graphics Processing Unit (GPU)

　　→ Smart cards

　　　　・Credit card with an embedded chip

　　→ Specialty processors in cars (OGS-HGS)

　　→ RFID tags

　　　　・Information chips

　　　　・Embedded in merchandise to track their location

3-) MEMORY　(Ram-Rom-Flash)

→ Holding area for data, instructions and information

→ Chips connected to the system board

1. RAM (Random Access Memory)

Chips hold programs and data that are currently being accessed

・Volatile　　・Cache memory or Rom cache　(Önbellek)

RAM = DIMM　　　Types; DRAM, SDRAM, DDR, Direct RDRAM

2. ROM (Read-Only Memory)

→ Information stored by the manufacturer.　　　→ ・Non-volatile

　　　　　　　　　　　　　　　　　　　　　　→ Cannot be changed

→ CPU can read, or retrieve data and programs in ROM but the comp. cannot change ROM

→ Contain special instructions; Start the computer

　　　　　　　　　　　　　　Access memory

　　　　　　　　　　　　　　Handle keyboard input

2-) Microprocessor

→ Central Processing Unit (CPU)　　　→ Contain a microprocessor chip

　　　　　　　　　　　　　　　　　　→ Brains of the computer

→ Basic Components:　→ Control Unit
　　　　　　　　　　　→ Arithmetic-logic unit (ALU)
　　　　　　　　　　　→ Registers

Microprocessor Chips

→ Chip processing capacities expressed in word size. (Word boyutu chip kapasitesi ile ifade edilir)

→ Word ; The number of bits that can be processed at one time. (Birim zamanda işlenilen bit sayısı)
　　　　32 bit or 64 bit.

→ Clock speed , → Processing speed (İşlemci hızı)

　　　→ The frequency that a processor executes instructions or that data is processed (İşlemcinin komutları veya veileri işleme frekansı)

　　(*) → The number of times the CPU fetches (alıp) and processes data or instructions in a second.

　　　→ Measured in millions of cycles per second or megahertz (MHz) (Saniyede milyon devir olarak hesaplanır)

→ Multi-Core Chip : Two seperate and independent CPU's
　　　　　　　　Parallel Processing
　　　　　　　　Two or more operations at the same time.
　　　　　　　　Windows 7 - Mac Os X