



# SHAKARIM UNIVERSITETI

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## SEMEEY

### **Introduction to computer systems. Architecture of computer systems**

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# Purpose

- Review of computer systems.
- Evolution of computer systems.
- Architecture and components of computer systems.
- Using computer systems.
- Data presentation in computer systems.

# Vocabulary

1. ИКТ – \_\_\_\_\_
2. Информатика – \_\_\_\_\_
3. Стандартизация – \_\_\_\_\_
4. Цель – \_\_\_\_\_
5. \_\_\_\_\_ – writing slates
6. Eradicate - \_\_\_\_\_
7. Poverty - \_\_\_\_\_
8. Hunger - \_\_\_\_\_
9. \_\_\_\_\_ – mortality
10. Reduce - \_\_\_\_\_
11. Ensure \_\_\_\_\_
12. Устойчивость – \_\_\_\_\_
13. Проблемы – \_\_\_\_\_
14. Правовые рамки - \_\_\_\_\_
15. Право - \_\_\_\_\_
16. \_\_\_\_\_ – tools
17. \_\_\_\_\_ - emergence
18. \_\_\_\_\_ – cave
19. \_\_\_\_\_ – pamphlet
20. определение - \_\_\_\_\_

# Vocabulary

1. Database - база данных
2. Software - программного обеспечения
3. Hardware - аппаратные средства
4. Storage of data - хранение данных
5. To transmit information - передавать информацию
6. Calculate - вычислять
7. Compare -сравнивать
8. Sort - сортировать
9. User interface - интерфейс пользователя
10. Machine readable – машиночитываемая

# Vocabulary

1. Data entry - ввод данных
2. Binary numbering system - бинарная система нумерации
3. Decimal numbering system - десятичная система нумерации
4. Detect - обнаруживать
5. Invent - изобретать
6. Measurement - измерение
7. Denote - обозначать
8. Consider - рассматривать
9. Disseminate – распространять
10. Gesture - жест

# *Answer my questions*

- What is definition of ICT ?
- What is main purposes of ICT ?
- What kind of Standardization in ICT, do you know ?

# System



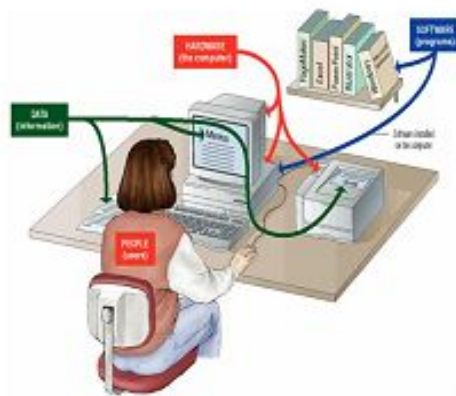
A **system** is a set of elements or components that interact to accomplish goals.

# Review of computer systems

## What is a Computer System?

A complete computer system consists of four parts

1. Hardware
2. Software
3. Users
4. Data



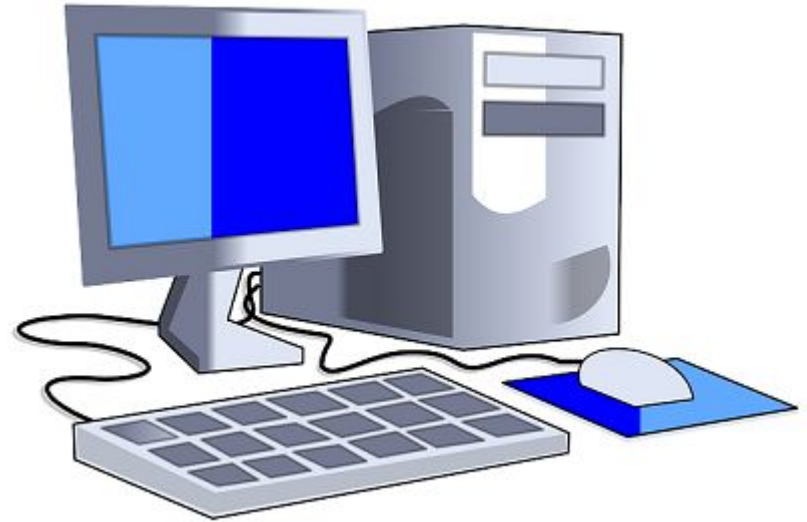
1) Computer system is defined as the combination of hardware, software, user and data.

2) An organized combination of people, hardware, software, communications networks, and data resources that collects data, transforms it, and disseminates information.



# A Computer ....

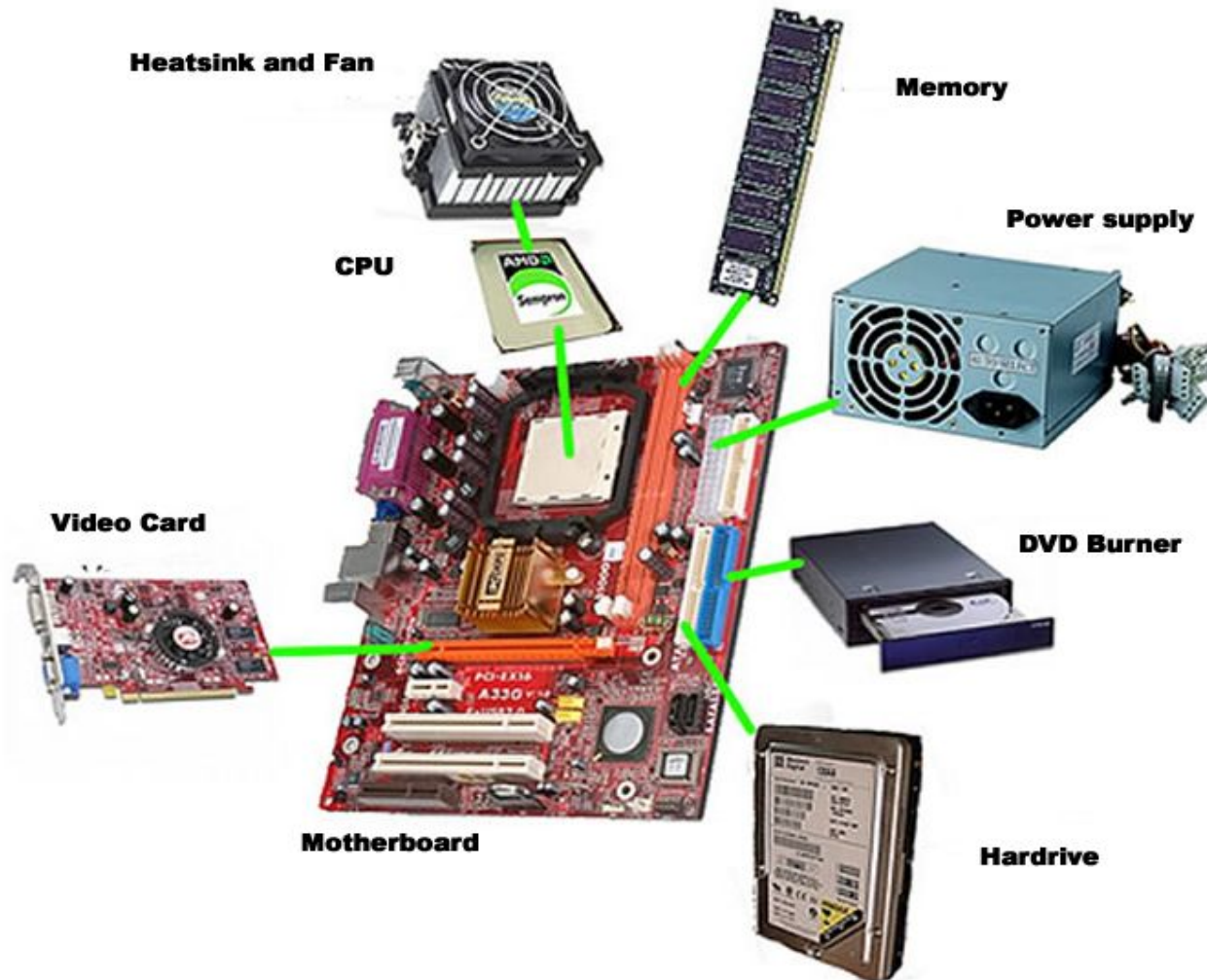
- takes input
- processes it according to stored instructions
- produces results as output



# A Computer ....



# System unit



# Types of Computer

Computer

Special Purpose  
(embedded systems)

Pre-programmed

Watches

Telephones

Televisions

General Purpose  
(user-programmable)

Personal Computers

Workstations

Mainframes

Supercomputers

# Review of computer systems

## Hardware:

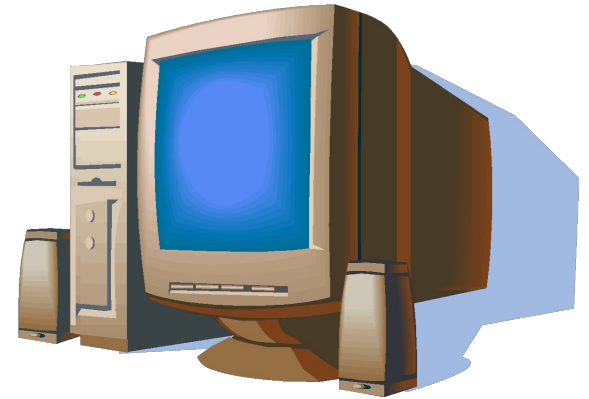
Computer Equipment

## Software:

Computer Programs

## Databases:

An organized collections of facts



# Information can be presented in various forms:

in the form of symbolic or writing for example: text, numbers, symbols (text tutorial), graphics (map), tables;

in the form of gestures or signals (traffic light);

in the form of verbal (conversation);

# Unit of information's volume

Name	Symbol	Relationship with other units
Kilobit	Kbit	1 Kbit = 1024 bit = $2^{10}$ bit $\approx$ 1000 bit
Megabit	Mbit	1 Mbit = 1024 Kbit = $2^{20}$ bit $\approx$ 1 000 000 bit
Gigabit	Gbit	1 Gbit = 1024 Mbit = $2^{30}$ bit $\approx$ 1 000 000 000 bit
Kilobyte	Kbyte (Kb)	1 Kbyte = 1024 byte = $2^{10}$ byte $\approx$ 1000 byte
Megabyte	Mbyte (Mb)	1 Mbyte = 1024 Kbyte = $2^{20}$ byte $\approx$ 1 000 000 byte
Gigabyte	Gbyte (Gb)	1 Gbyte = 1024 Mbyte = $2^{30}$ byte $\approx$ 1 000 000 000 byte

# Encryption the information

Code - a set of symbols to represent information.

Encoding - is a process of presentation the information in the form of code.



# Bits and Bytes

Bit - is the smallest unit of information's volume measurement and denoted by a binary number.

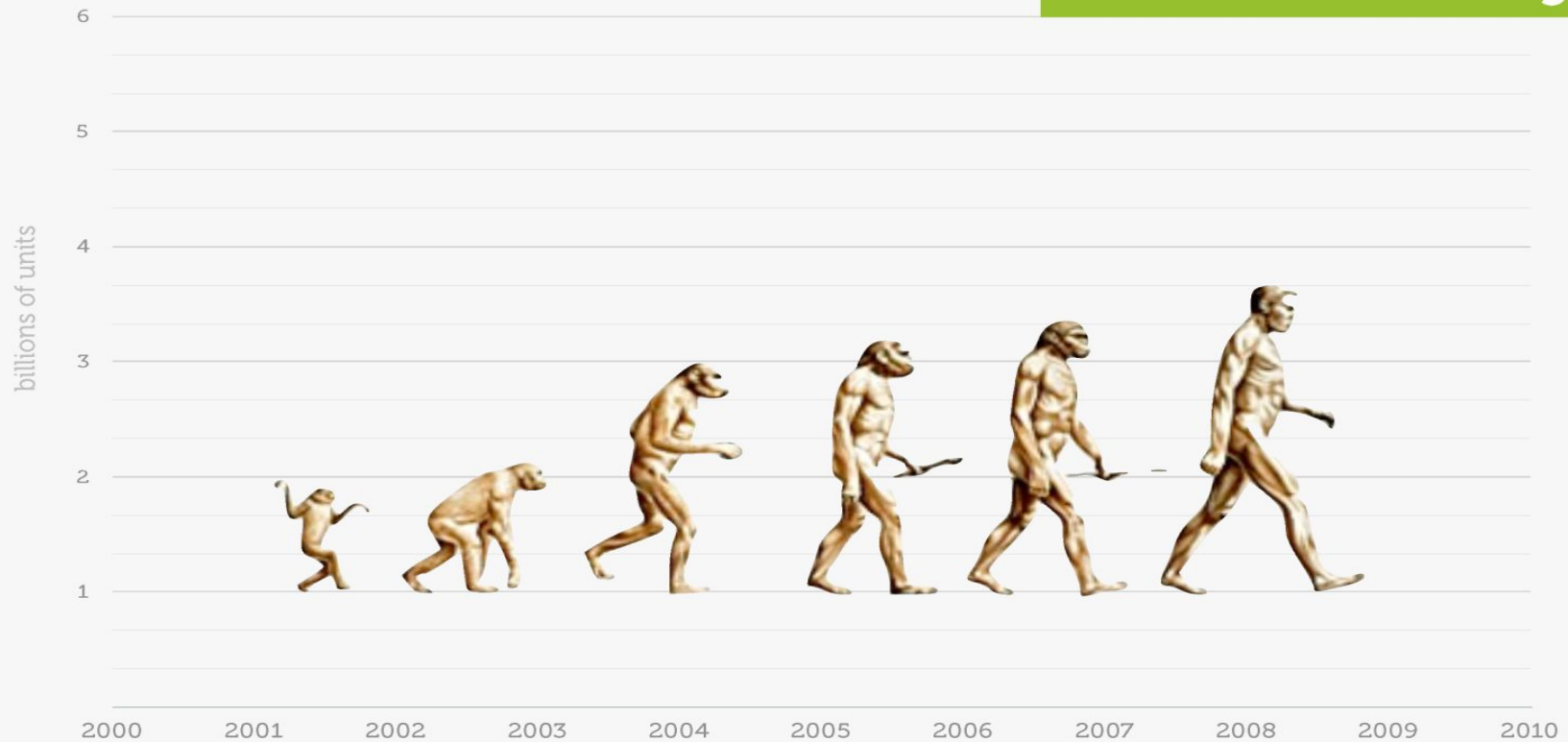
These two symbols 0 and 1 are called bits

More larger units of information's volume measurement is considered to be 1 byte, which consists of 8 bits.

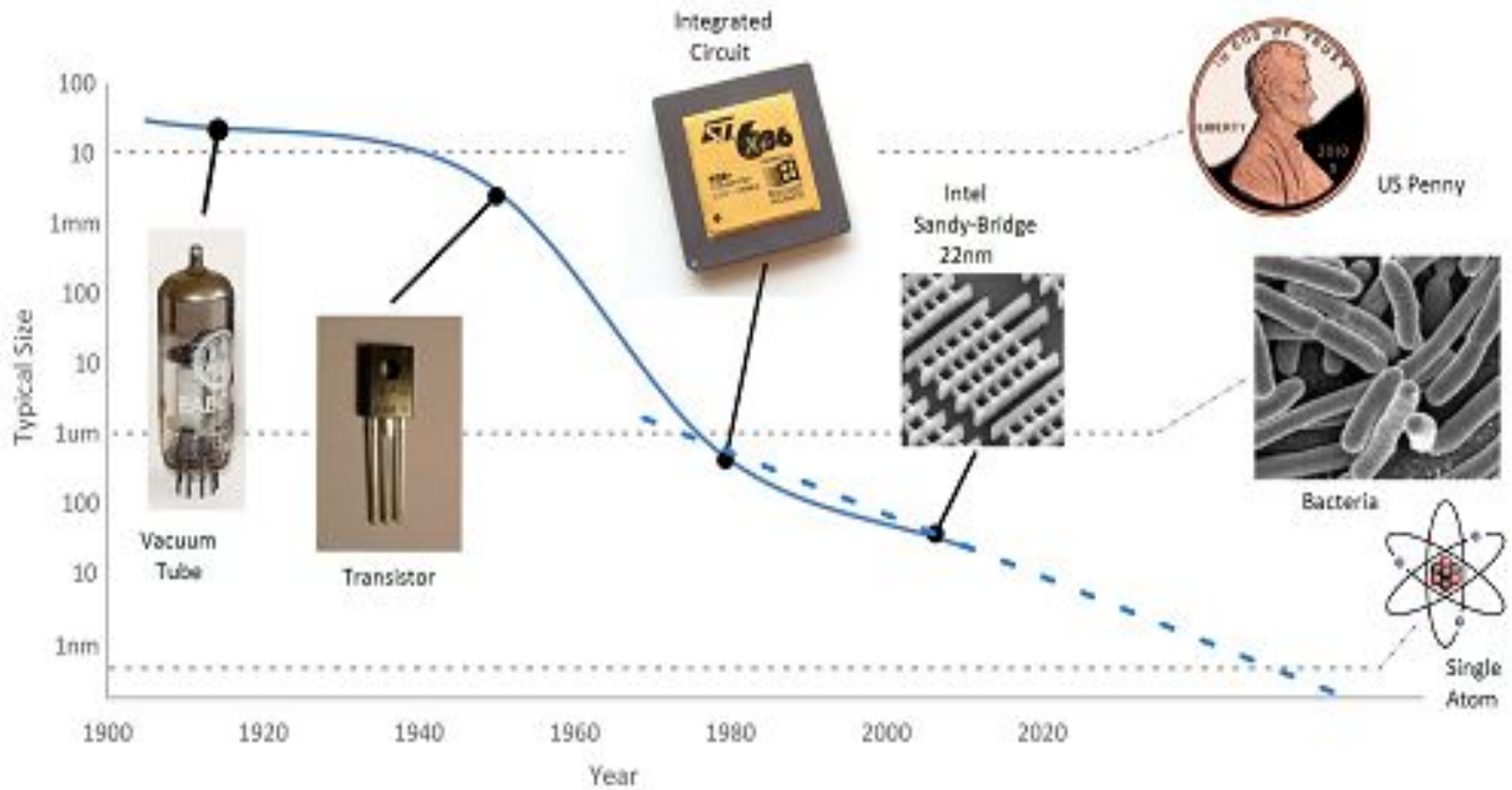
1 byte = 8 bits.

# Evolution of computer systems.

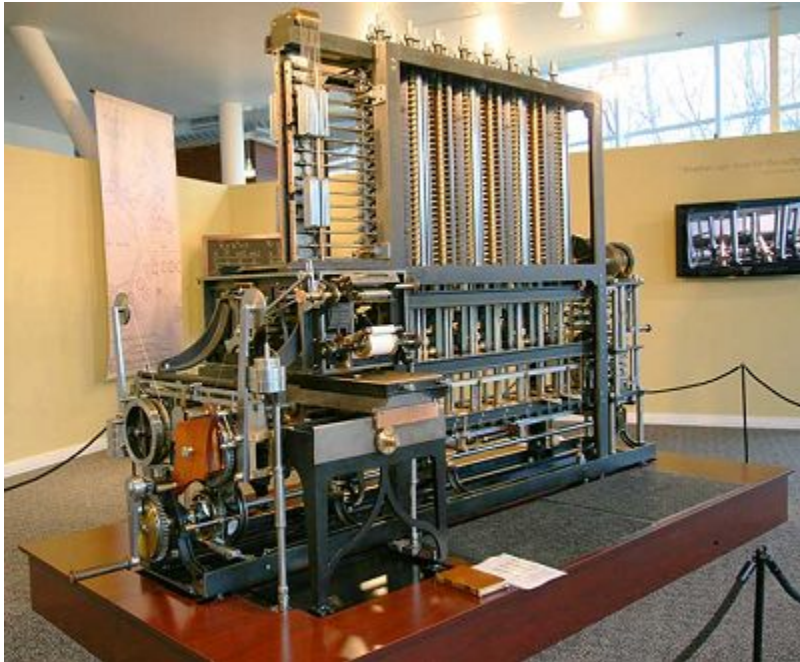
a little history



# Evolution of computer systems.

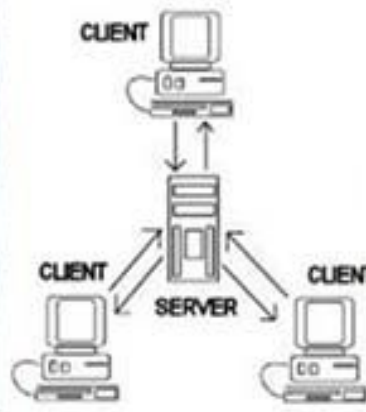
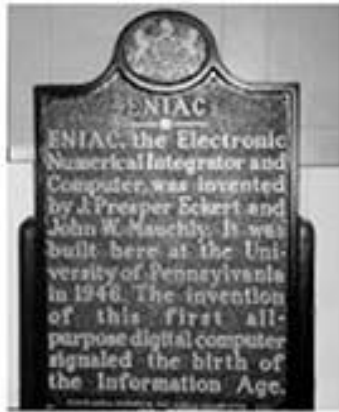


# Evolution of computer systems.



Charles Babbage (1791-1871) designed the first automatic computing engine. He invented computers but failed to build them. The first complete Babbage Engine was completed in London in 2002, 153 years after it was designed.

# Evolution of computer systems.



ENIAC (Electronic numerical integrator And Computer)

IBM Mainframe

Microsoft Office, OS

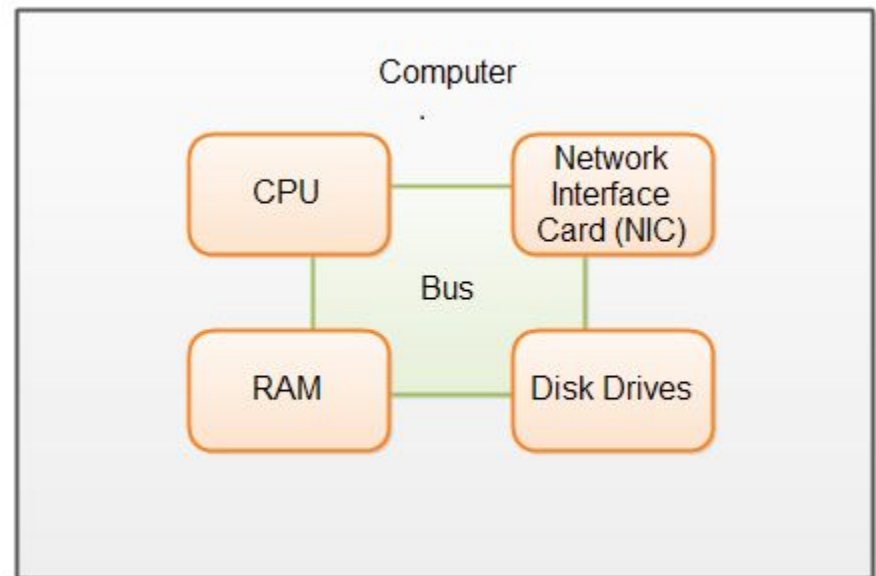
World-Wide-Web  
Google

Social Media



# Architecture and components of computer systems.

Computer architecture deals with the logical and physical design of a computer system.

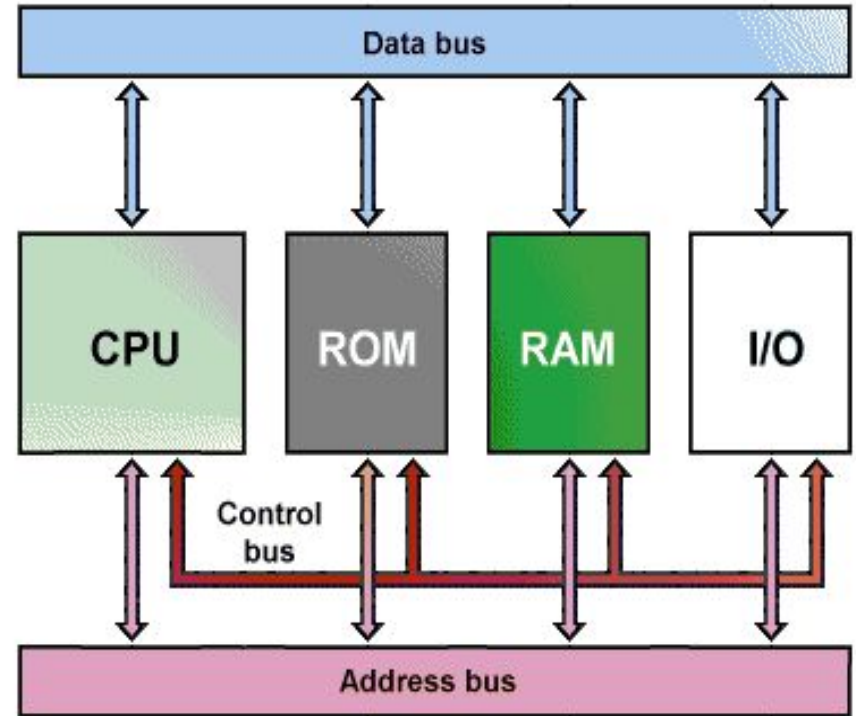
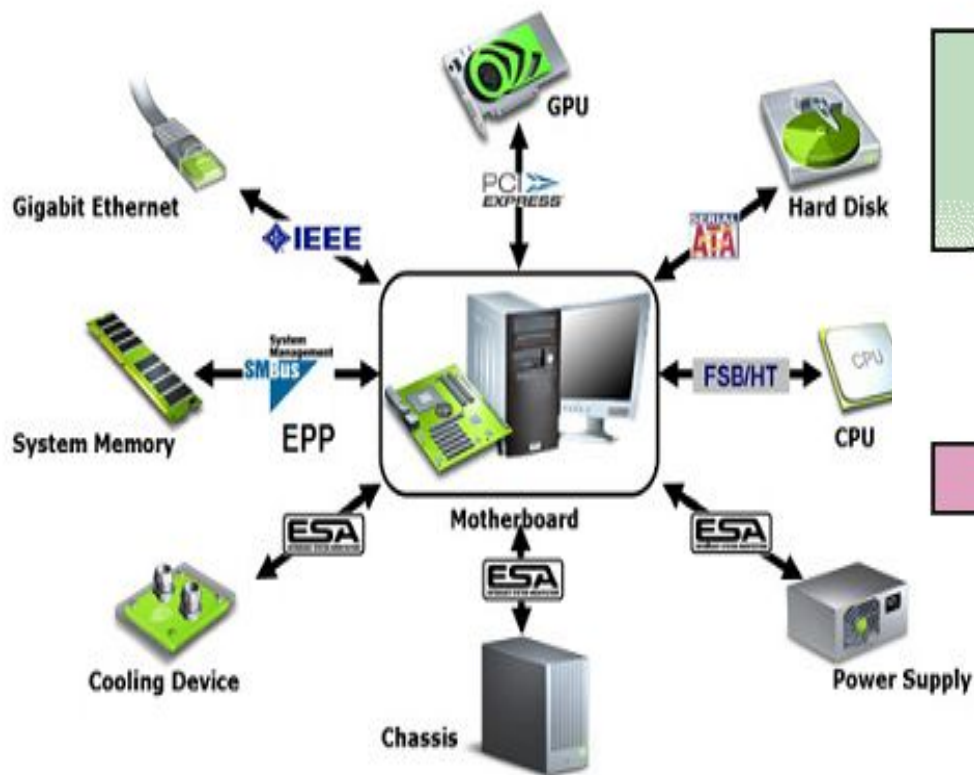


# Architecture and components of computer systems.

The main components required for a computer system are listed below:

- Central processing unit (CPU)
- Random access memory (RAM)
- Read-only memory (ROM)
- Input / output (I/O) ports
- The system bus
- A power supply unit (PSU)

# Architecture and components of computer systems.





# Architecture and components of computer systems.

# Using computer systems.



When we are learning

When we are working



# Using computer systems.

# Data presentation in computer systems.

## Detecting Voltage Levels

- Why not 10 levels?
  - Would be unreliable
  - Not enough difference between states
- On/Off
- Fully Charged - Fully Discharged
- Magnetized - Demagnetized

# Bits, Bytes, and so on

- A bit is one 0 or 1
  - Short for “binary digit”
- A byte is a collection of 8 bits
  - They named it “byte” instead of “bite” so you couldn’t easily mess up the spelling and confuse it with “bit”.

# The Binary Numbering System

- A computer's internal storage techniques are different from the way people represent information in daily lives
  - We see and type numbers and letters.
  - The computer sees ones and zeros for everything
- All information inside a digital computer is stored as a collection of binary data

# Binary Representation of Numeric and Textual Information

- Binary numbering system

- Base-2

- Built from ones and zeros

- Each position is a power of 2

$$1101 = 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$$

- Decimal numbering system

- Base-10

- Each position is a power of 10

$$3052 = 3 \times 10^3 + 0 \times 10^2 + 5 \times 10^1 + 2 \times 10^0$$

# Input of Data Resources

- Data entry
- Editing
- Machine readable
- Source documents
  - Formal record of a transaction
- User interface
  - How users interact with information system
  - Optical scanning; menu; prompts; fill in blanks



# Process Data into Information

- Calculate
- Compare
- Sort
- Classify
- Summarize

The quality of the data must be maintained by a continual process of correcting and updating activities

# Output of Information

- Transmit information to users
  - Display; paper; audio
- Storage of data
  - Data are retained in an organized manner
    - Fields; records; files; data bases
- Control of system performance
  - Feedback must be monitored and evaluated to determine if the information system is meeting established performance standards

# Information System Resources

**People**

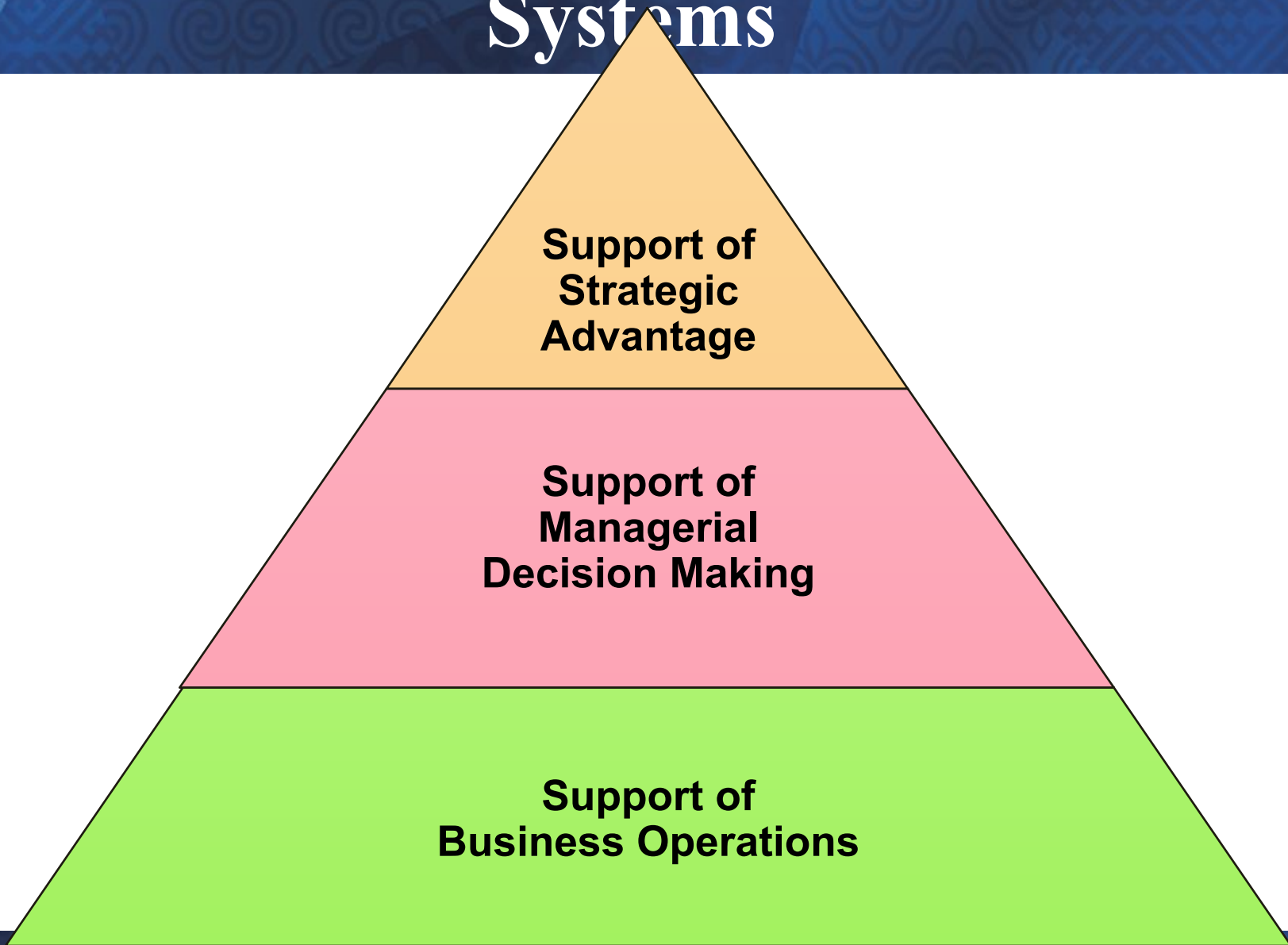
**Data**

**Software**

**Hardware**

**Networks**

# Roles of Information Systems



# A Framework for Business

## End Users

**Management of IS**  
Resources and Strategies

**Development of IS**  
Solutions to Business Problems

**Applications of IS**  
To Operations, Management, and Strategic Advantage

**Technology IS**  
Hardware, Software, Networks , and Data Management

**Foundation Concepts of IS**  
Fundamental Behavioral and Technical Concepts

Q&A.

**Have you any questions ???**

*Thank you for your attention !!!*