SHAKARIM UNIVERSITETI

SEMEY

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 – машиносчитываемая

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

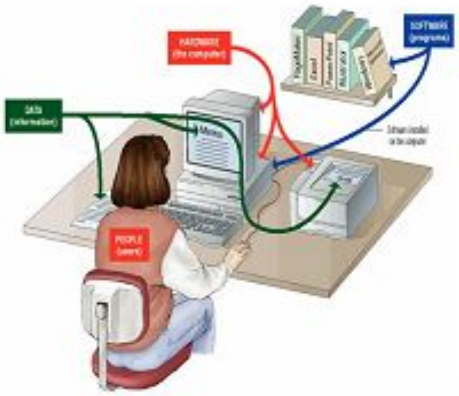
A **system** is a set of elements or components that interact to accomplish goals.

Review of computer systems

What is a Computer System?

A complete computer system consists of four parts

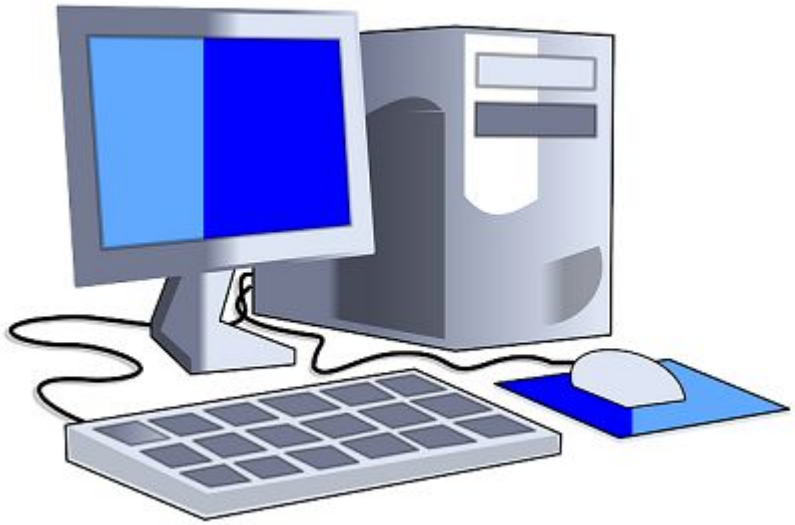
1. Hardware
2. Software
3. Users
4. Data



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 ....

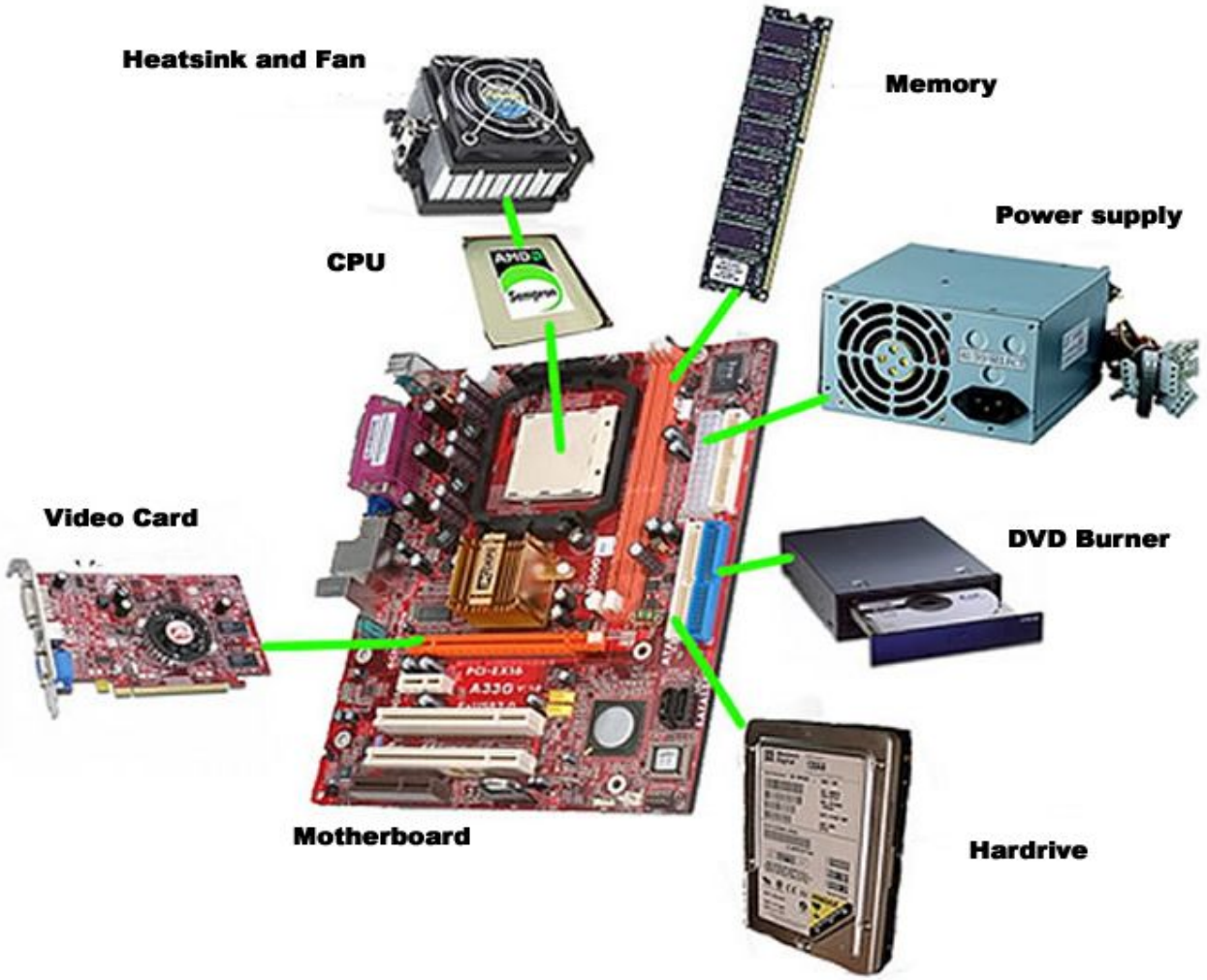


- takes input
- processes it according to stored instructions
- produces results as output

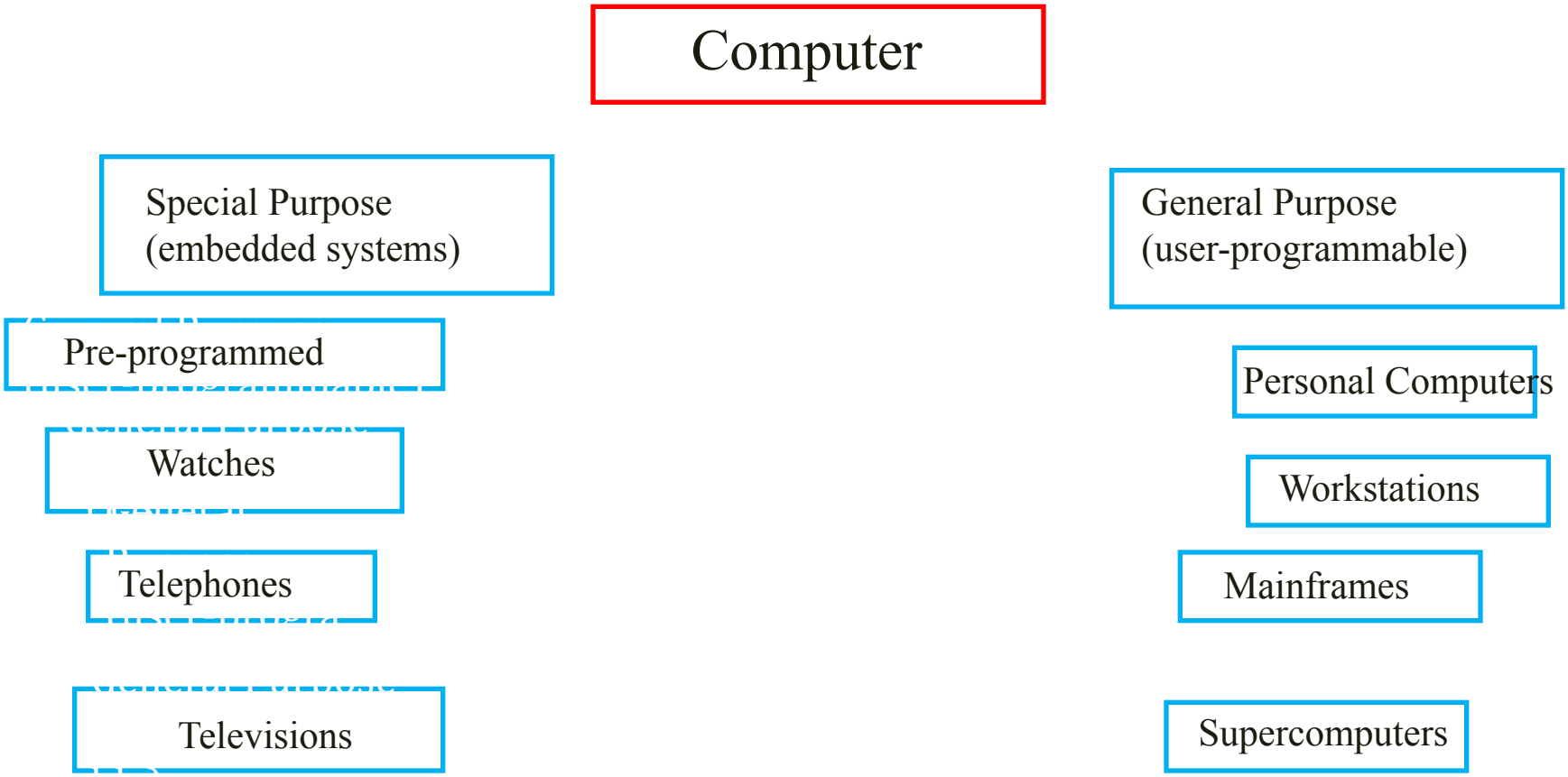
A Computer ....


SPEAKERS
Used to produce audio output.
MONITOR
An output device that lets you see your work as you go.
CD/DVD DRIVE
Reads CD/DVD discs.
SYSTEM UNIT
The case that contains the CPU, memory, the power supply, disk drives, and all other hardware— such as a modem— that are in an internal format.
PRINTER
Produces printed copies of computer output.
MICROPHONE
Used to get spoken input.
FLOPPY DISKS
Used for storing small amounts of data for backup or to transport data to another PC.
KEYBOARD
The principal input device; used to type instructions into the computer.
CD/DVD DISCS
Commonly used to deliver programs and store large multimedia files.
MOUSE
A pointing device used to make on-screen selections.
FLOPPY DISK DRIVE
Reads from and writes to floppy disks.
HARD DRIVE
Located inside the system unit and used to store programs and most data.
FLASH MEMORY CARD READER
Used to read flash memory cards.

System unit


Heatsink and Fan
Memory
Power supply
CPU
Video Card
DVD Burner
Motherboard
Hardrive

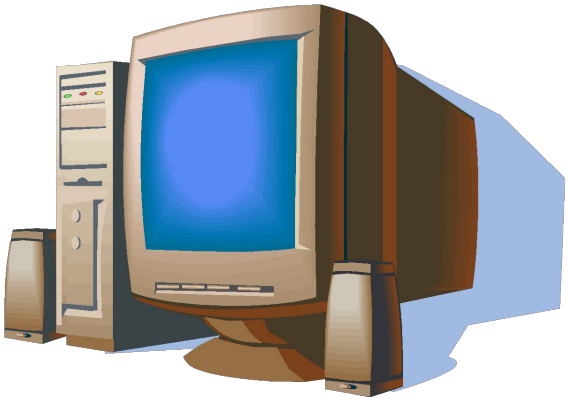
Types of Computer



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 ≈ 1000 bit
Megabit	Mbit	1 Mbit = 1024 Kbit = 2^{20} bit ≈ 1 000 000 bit
Gigabit	Gbit	1 Gbit = 1024 Mbit = 2^{30} bit ≈ 1 000 000 000 bit
Kilobyte	Kbyte (Kb)	1 Kbyte = 1024 byte = 2^{10} byte ≈ 1000 byte
Megabyte	Mbyte (Mb)	1 Mbyte = 1024 Kbyte = 2^{20} byte ≈ 1 000 000 byte
Gigabyte	Gbyte (Gb)	1 Gbyte = 1024 Mbyte = 2^{30} byte ≈ 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

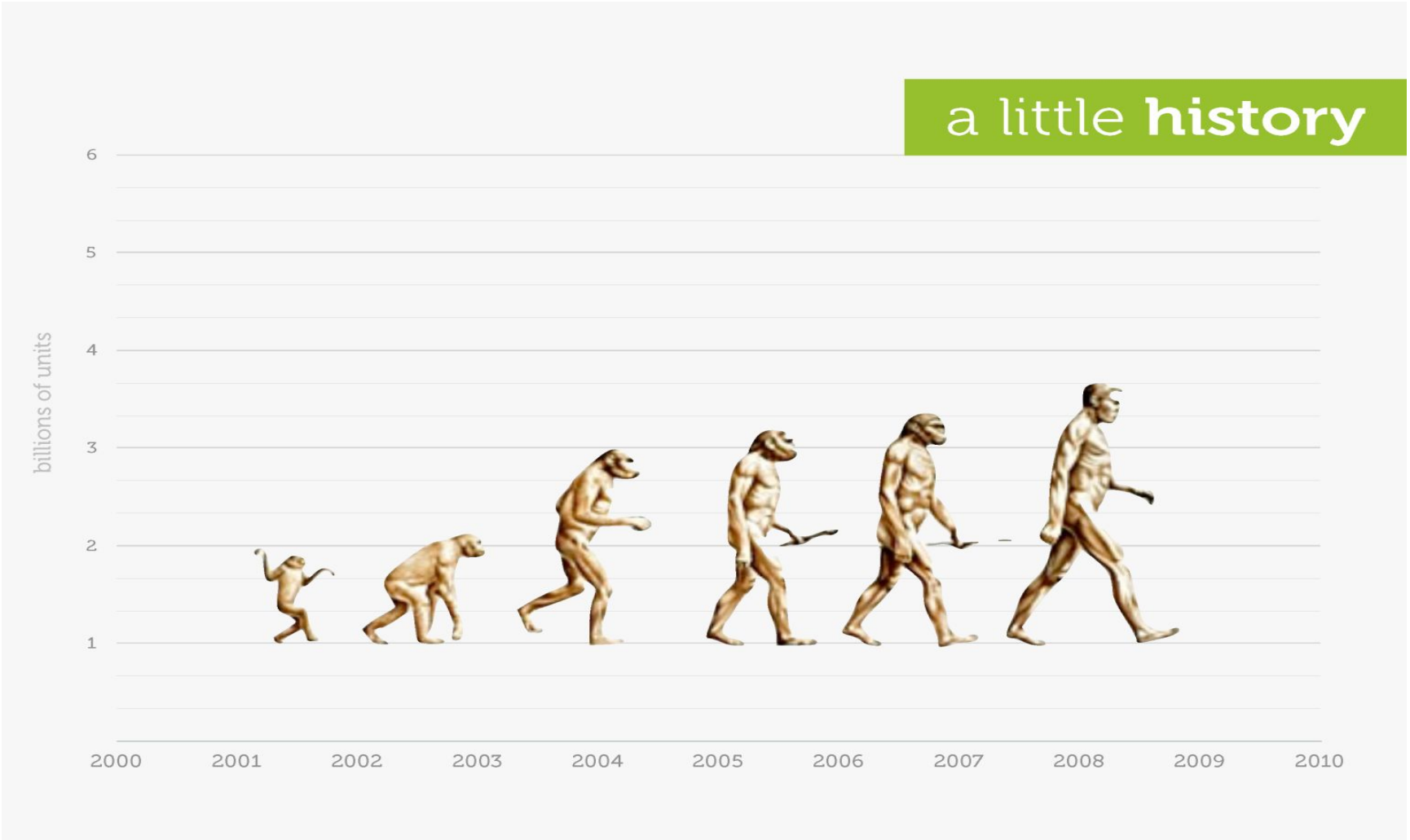
Bit - is the smallest unit of information's volume measurement and denoted by a binary number.

These two symbols 0 and 1 are called bits

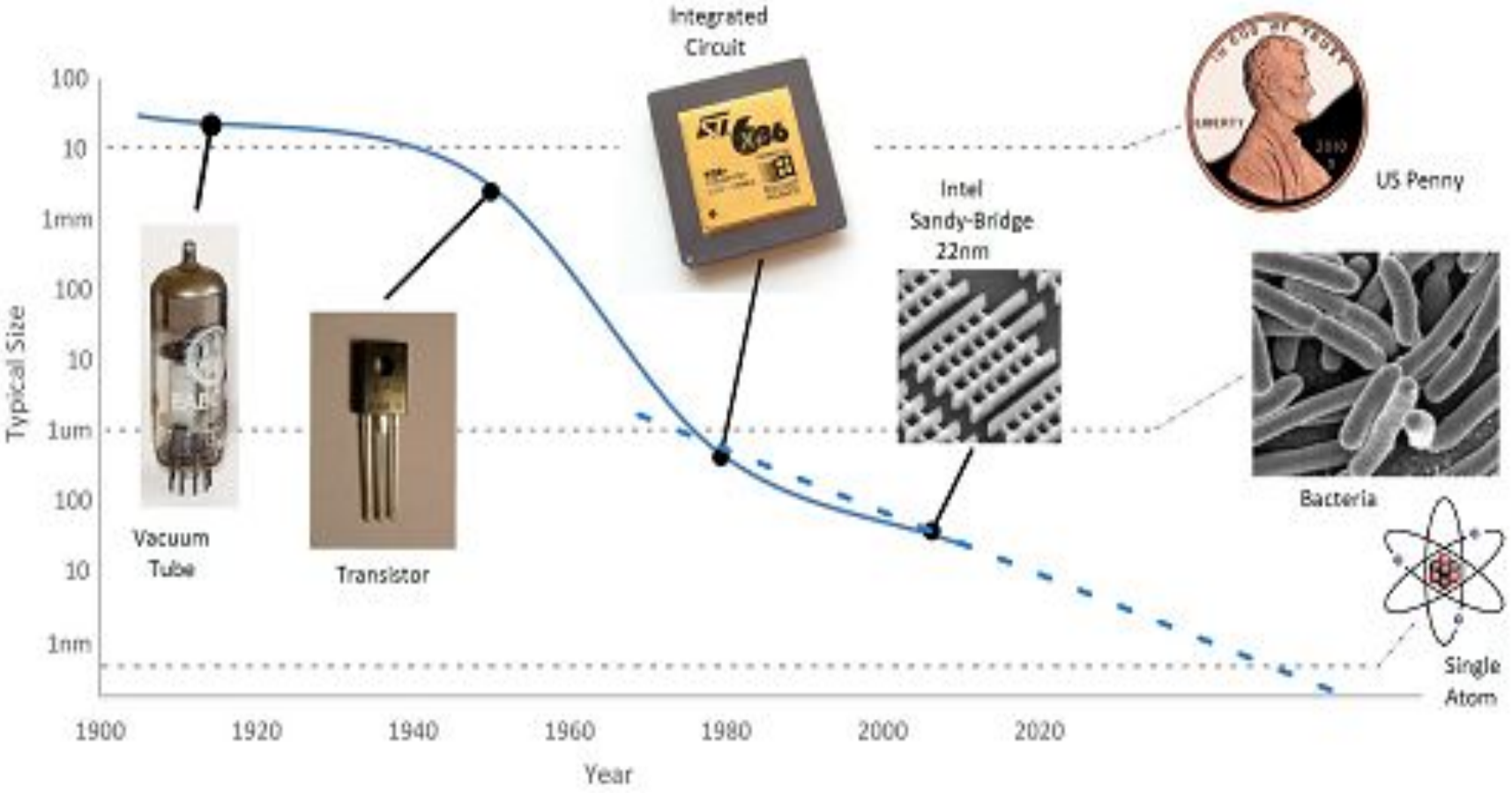
More larger units of information's volume measurement is considered to be 1 byte, which consists of 8 bits.

1 byte = 8 bits.

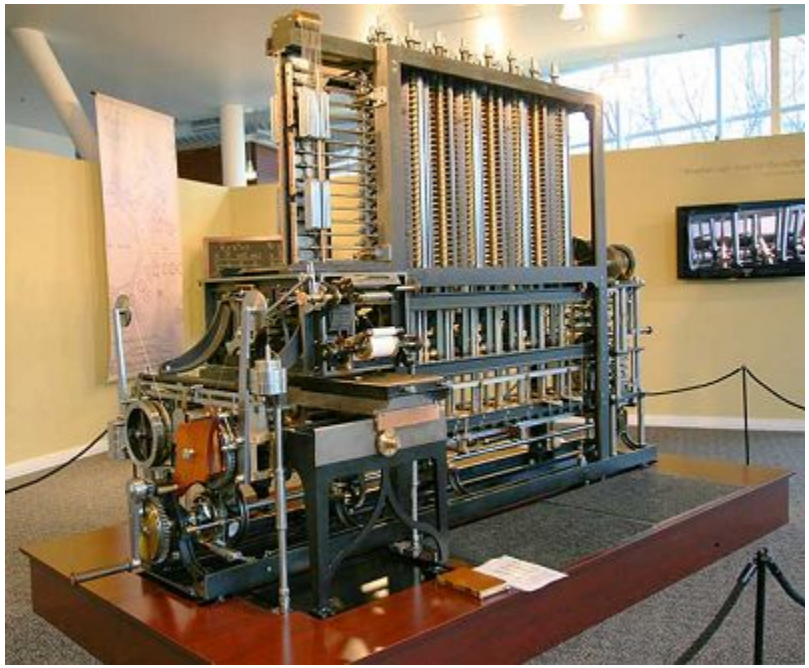
Evolution of computer systems.



Evolution of computer systems.

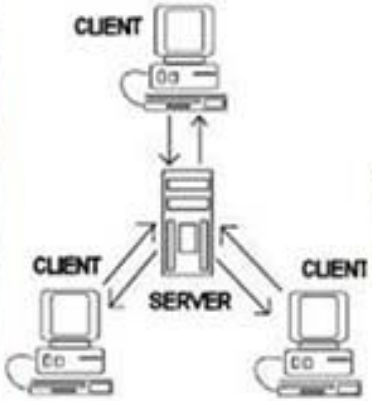


Evolution of computer systems.



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

1950-60s — First computer

1970s — Mainframe-based

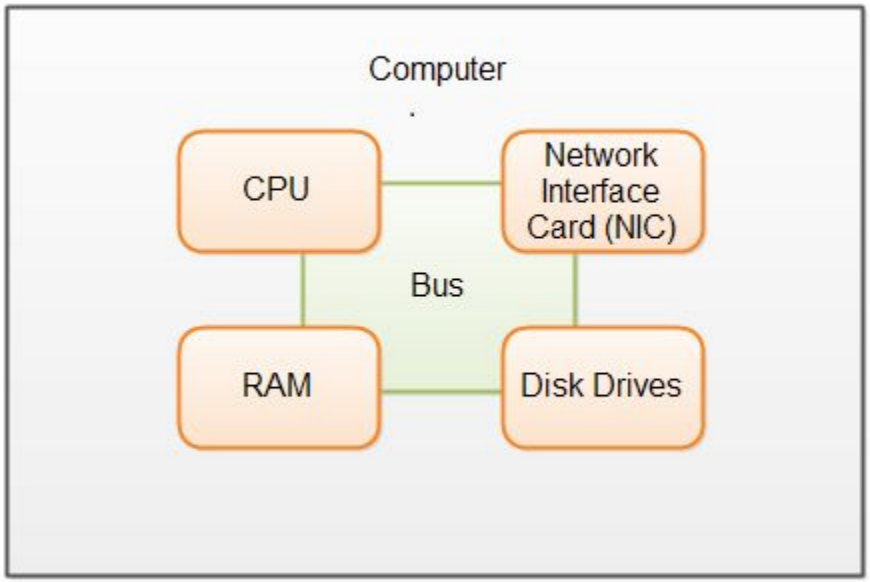
1980s — Client Server

1990s — Internet-based

2000s — Social-computing

Architecture and components of computer systems.

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

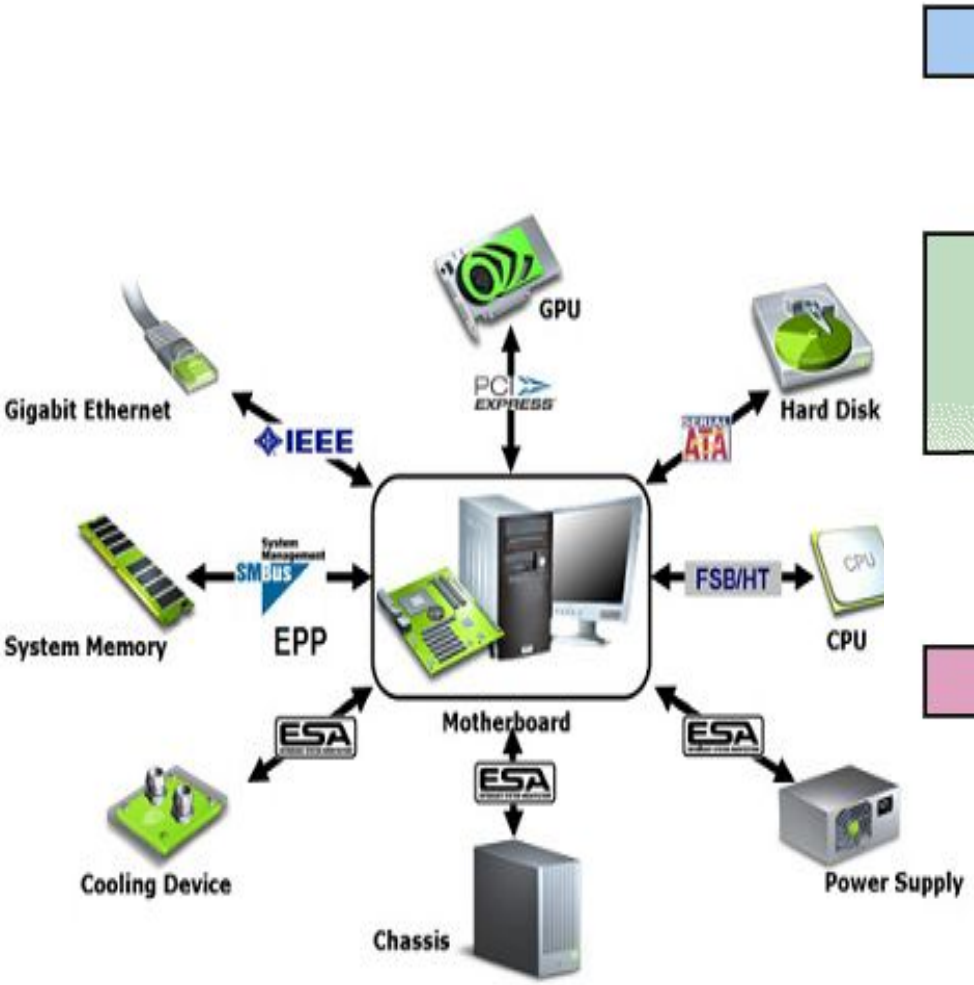


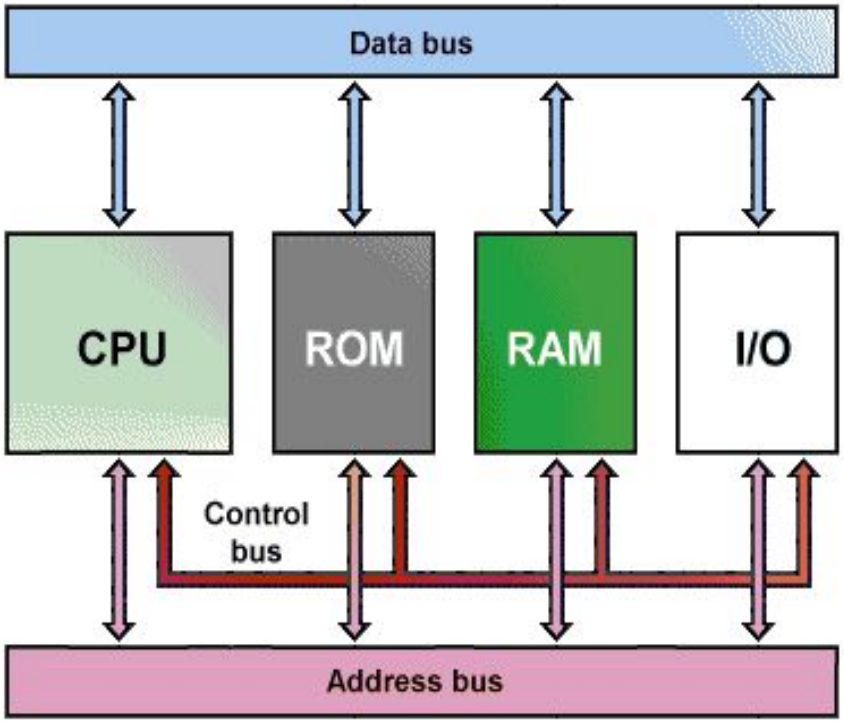
Architecture and components of computer systems.

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.





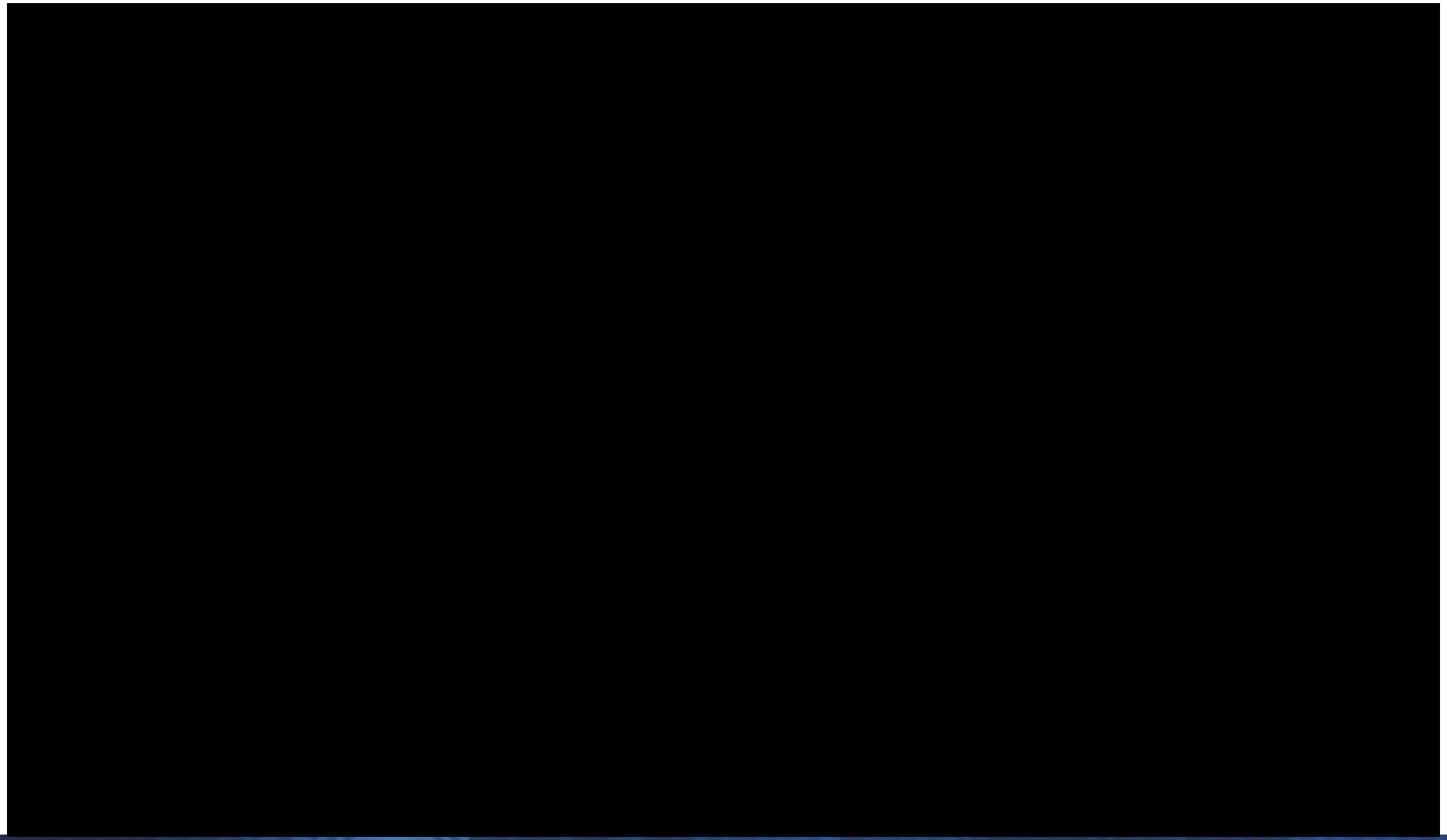
Architecture and components of computer systems.

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

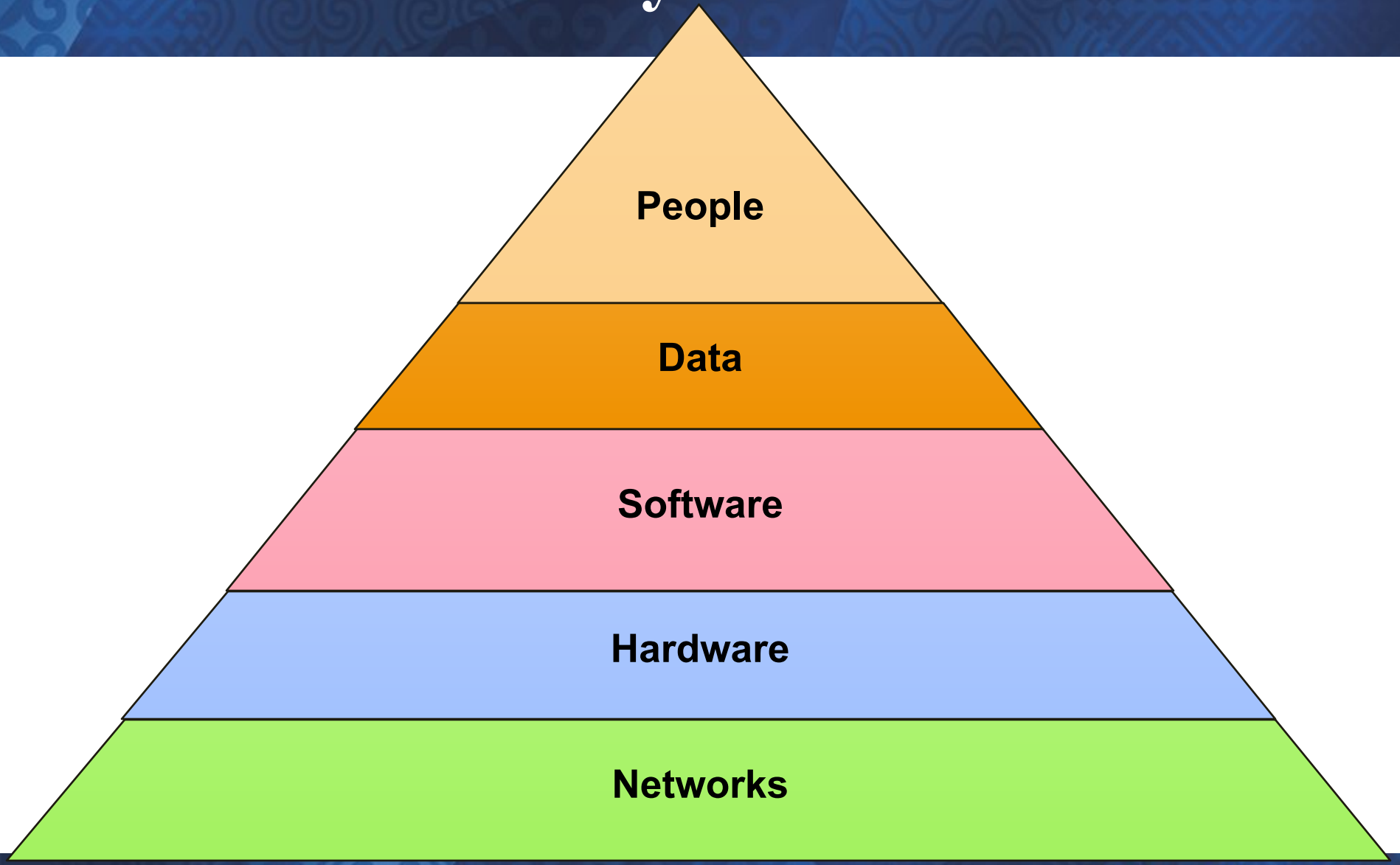
- Calculate
- Compare
- Sort
- Classify
- Summarize

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

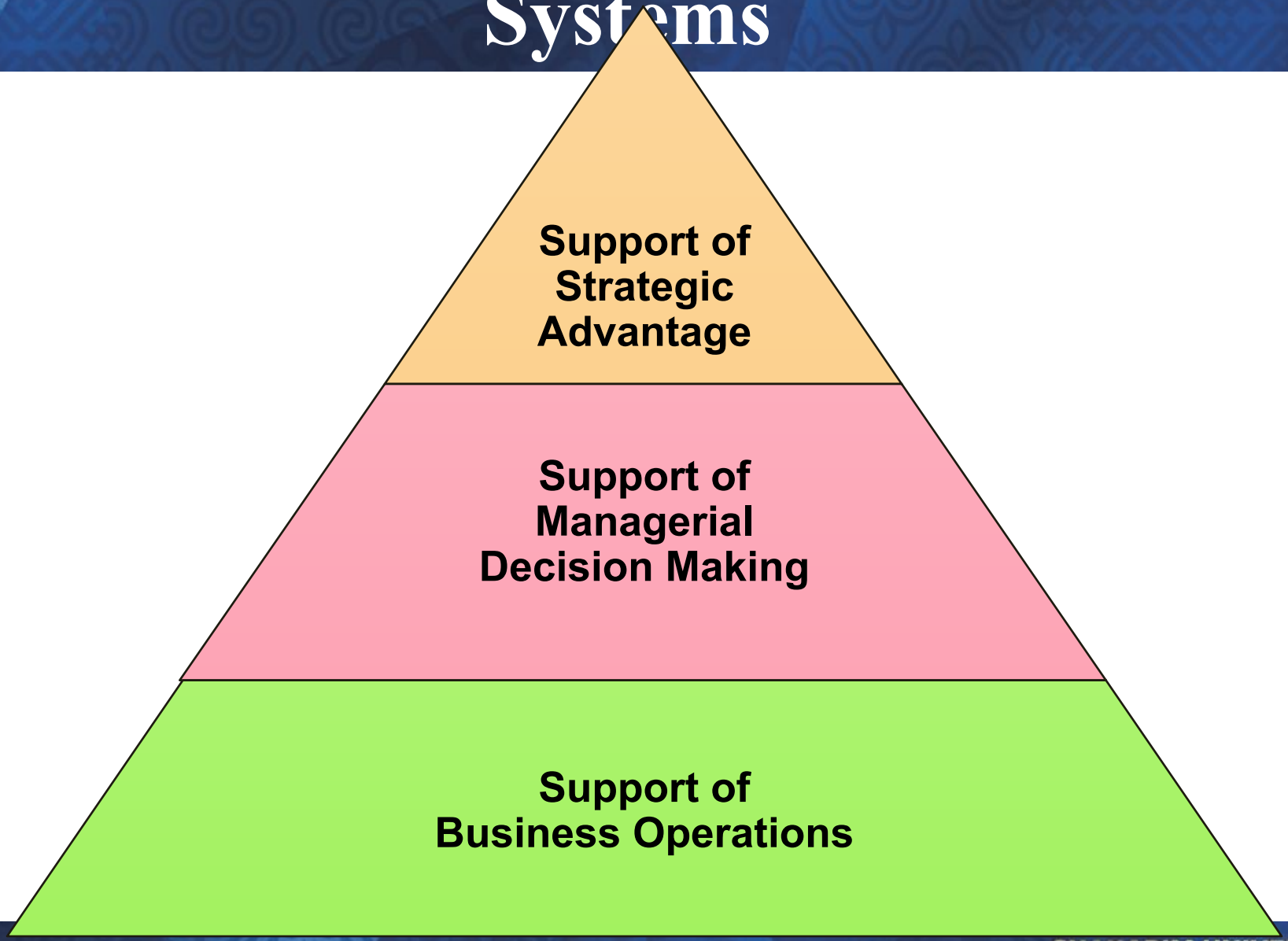
Output of Information

- 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

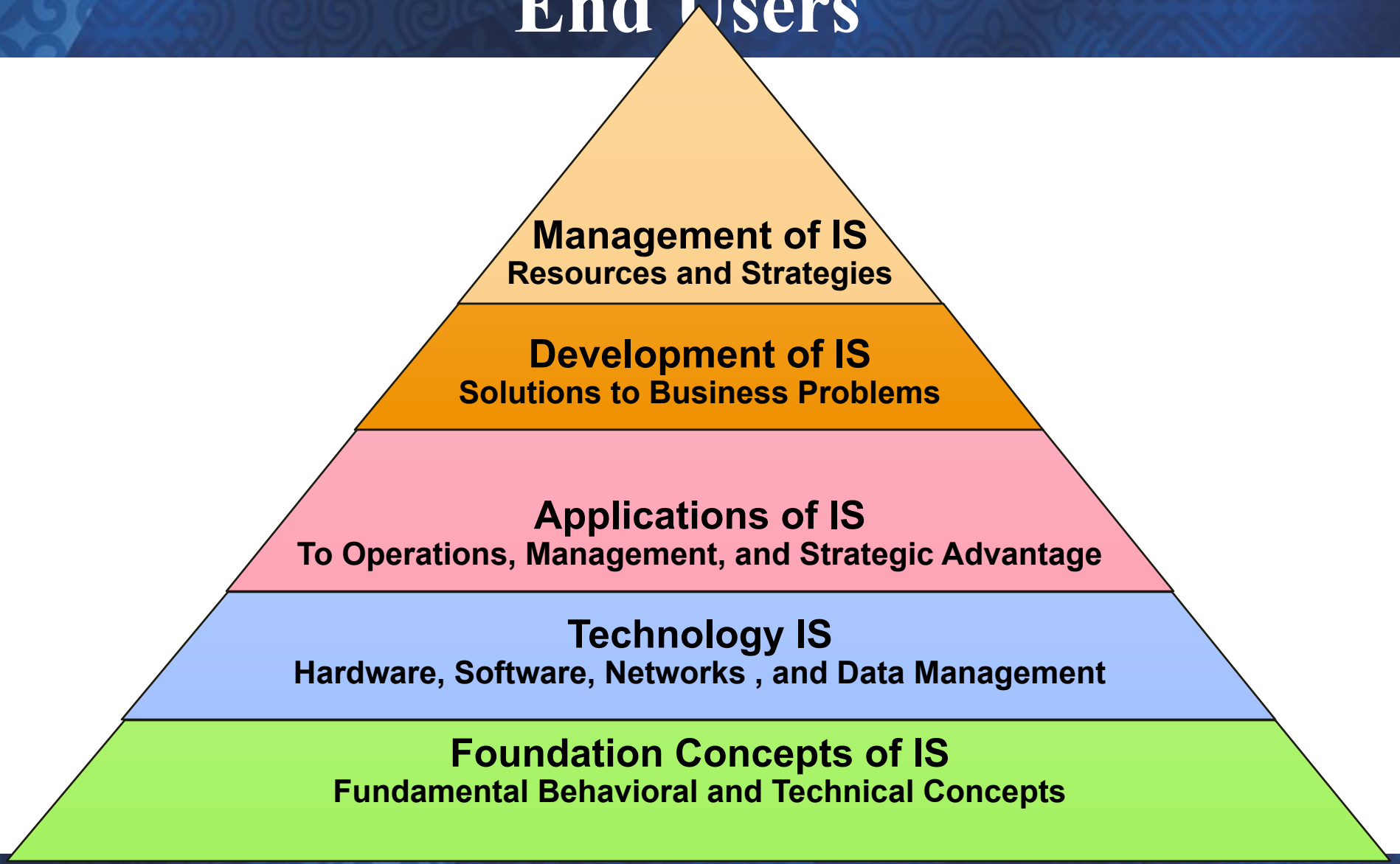
Information System Resources



Roles of Information Systems



A Framework for Business End Users



Q&A.

Have you any questions ???

Thank you for your attention !!!