Egyptian E-Learning University
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EELU
الجامعة المصرية للتعلم الإلكتروني الأهلية
THE EGYPTIAN E-LEARNING UNIVERSITY

Introduction to Information Technology
Lecturer 5

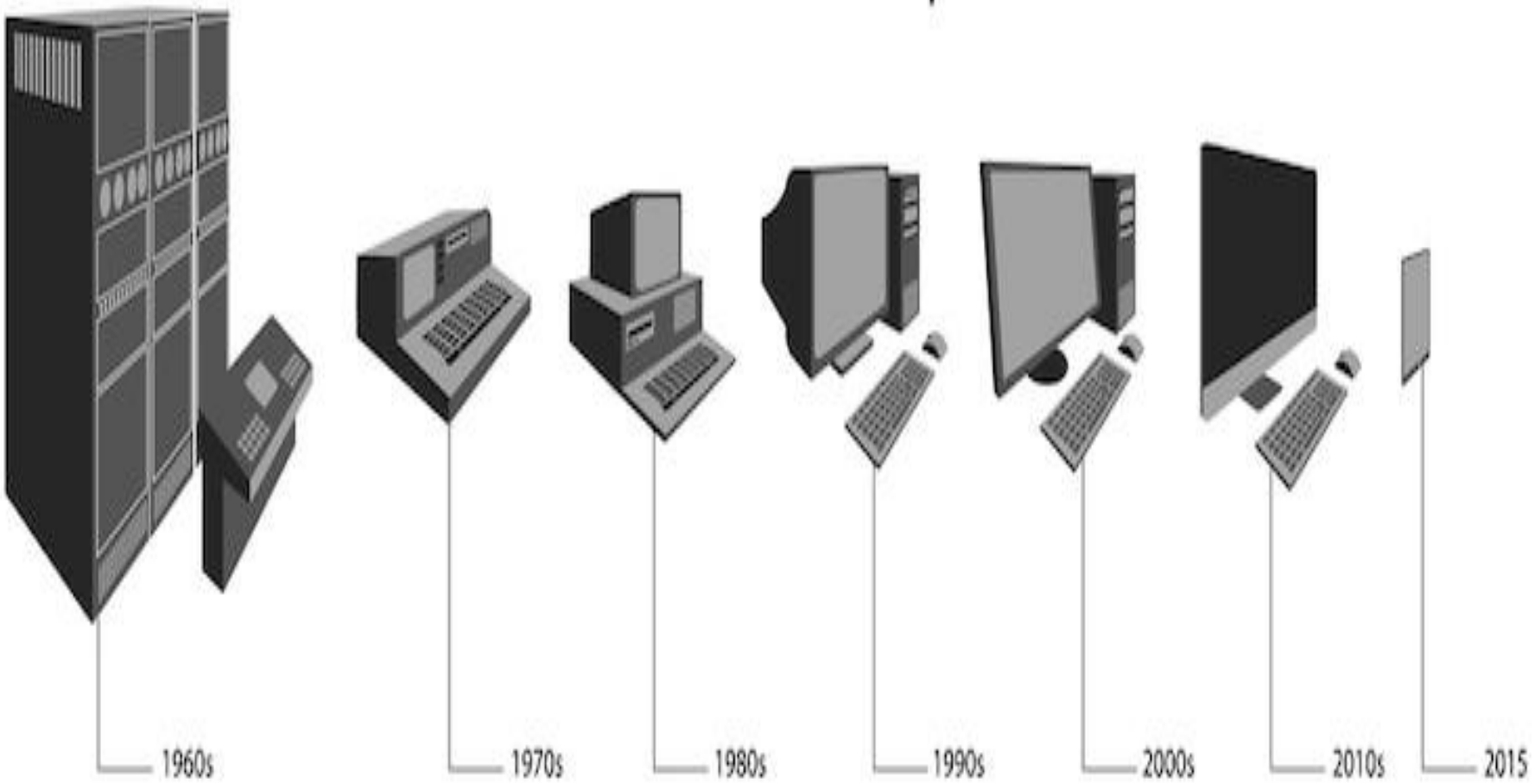
Agenda

Objectives

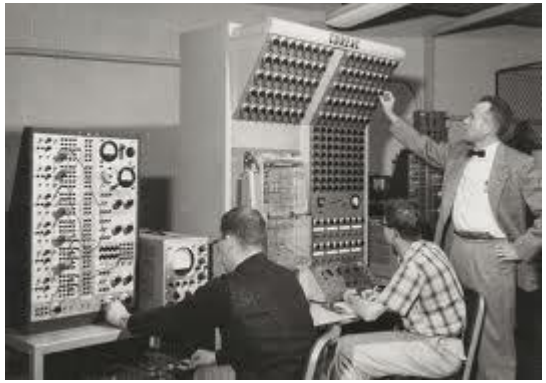
1. Explain Evolution of Computer.
2. Describe The Generations of Computer.
    1. First Generation Computers
    2. Second Generation Computers
    3. Third Generation Computers
    4. Fourth Generation Computers
    5. Fifth Generation Computers
3. Evolution of Communication and Network (Described before)
4. Evolution of Multimedia
5. Human Computer Interaction (HCI)

Summary

Evolution of computers



The Five Generations of Computers



Generations of Computer

- The computer has evolved from a **large-sized simple calculating machine** to a **smaller but much more powerful machine**.

- The evolution of computer to the current state is defined in terms of **the generations of computer**.

- Each generation of computer is **designed based on** a **new technological development, resulting in better, cheaper and smaller computers that are more powerful, faster and efficient than their predecessors**.

Generations of Computer (Cont.)

- Currently, there are **five generations** of computer. In the following subsections, we will discuss the generations of computer in terms of the **technology** used by them **(hardware and software), computing characteristics** (speed, i.e., number of instructions executed per second), **physical appearance, and their applications.**

First Generation Computers (1940-1956)

- The first computers **used vacuum tubes(a sealed glass tube containing a near-vacuum which allows the free passage of electric current.)** for circuitry and magnetic drums for memory.
- **They were often enormous and taking up entire room.**
- First generation computers relied on **machine language**.
- They were **very expensive** to **operate and in addition to using a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions(defect or breakdown).**
- **The UNIVAC (Universal Automatic Computer)** and **ENIAC (Electronic Numerical Integrator And Computer)** computers **are examples of first-generation computing devices**.

First Generation Computers

Advantages :

- It was **only electronic device**
- **First device to hold memory**

Disadvantages :

- **Too bulky** i.e large in size
- Vacuum tubes burn frequently
- They were producing heat
- Maintenance problems

Second Generation Computers (1956-1963)

- **Transistors** replaced **vacuum tubes** and ushered in the second generation of computers.
- Second-generation computers moved from **cryptic binary machine language to symbolic**.
- **High-level programming languages** were also being developed at this time, such as early **versions of COBOL and FORTRAN**.
- These were also the first computers that **stored their instructions in their memory**.

Second Generation Computers

Advantages :

- **Size reduced considerably**
- **The very fast**
- **Very much reliable**

Disadvantages :

- **They over heated quickly**
- **Maintenance problems**

Third Generation Computers (1964-1971)

- The development of the **integrated circuit** was the **hallmark of the third generation of computers**.
- **Transistors** **were miniaturized and placed on silicon chips**, called **semiconductors**.
- Instead of **punched cards and printouts**, users interacted with third generation computers through **keyboards and monitors and interfaced with an operating system.**
- **Allowed the device** **to run many different applications at one time**.

Third generation computers

Advantages :

- ICs are very small in size
- Improved performance
- Production cost cheap

Disadvantages :

- ICs are sophisticated

Fourth Generation Computers

Fourth Generation Computers (1971-present)

- The **microprocessor brought the fourth generation** of computers, as thousands of integrated circuits were built **onto a single silicon chip**.
- **The Intel 4004 chip**, developed in 1971, **located all the components of the computer**.
- From the **central processing unit and memory to input/output controls—on a single chip**.
- **Fourth generation computers** also saw the **development of GUIs, the mouse and handheld devices**.

Fifth Generation Computers

Fifth Generation Computers (present and beyond)

- Fifth generation computing devices, **based on artificial intelligence**
- Are still in development, though there are some applications, such as **voice recognition**.
- The use of **parallel processing** and superconductors is helping **to make artificial intelligence a reality**.
- The goal of fifth-generation computing is **to develop devices that respond to natural language input and are capable of learning and self-organization**.

Fifth generation computers (Present & Beyond)

Are technologies more advance and still being developed so that it is more efficient

The fifth generation computers are such as :

- **Silicone chips**
- **Processor Robotics**
- **Virtual reality**
- **Intelligent systems**

Programs which translate languages

New Era Computers

The technology of computers are more advance, sophisticated and modern

The latest invention of the new era are :

- **Super computers**
- **Mainframe computers**
- **Mini computers**
- **Personal computer**
- **Mobile computer**

Personal Computer Types

- Desktop
- Laptop (Notebook)
- Tablet PC
- Handheld

- **Desktop : small enough to fit on top of a desk yet too big to carry around**
- **Laptop : or notebook computers (key term) are portable, lightweight and bit into most briefcases**
- **Tablet : iPad for example, are smaller, lighter and less powerful than laptops and use a virtual keyboard.**
- **Handheld : contain an entire computer system. Smart phone is the most common handheld**

Virtual Reality

Virtual Reality: **simulated reality created in 3-d through computers. Creates a virtual or (immersive experience)**

Headgear and gloves have sensors to collect data that work with software

Evolution of Multimedia

Meaning of Multimedia

Originally

Two or more different media

Today

Products, processes, applications, and interactivity

Growth of Multimedia

- Multimedia first emerged in the 1980s **when desktop computers became more prevalent in businesses, schools, and homes**.

- Growth in multimedia exploded significantly as technology improved, allowing **animation, complex graphics, sound files, and video clips to be included in presentations**.

Multimedia Software

Originally

Limited

Today

Many

- Originally, because of the wide variety of computer systems and operating systems software, no set standards for multimedia were created; therefore, multimedia software development was limited.

- Nowadays, development of industry standards overcame this barrier and many companies started to develop new multimedia software.

Large files created by multimedia

Originally

- Limited internal and external storage mediums.
- Limited multimedia effectiveness due to processor speeds and RAM sizes.

Today

- Faster processors
- Audio cards
- Video cards, CDs, DVDs and flash jump drives.

Business Uses of Multimedia

- Businesses and organizations use multimedia **for marketing, training, and presentations purposes**.
- **Communication is the common denominator in all of the uses**

- **Presentations are customized for possible outcomes to:**
  - **Inform**
  - **Motivate**
  - **Persuade**
  - **Sell**
  - **Teach**
  - **Train**

Advantages of businesses using multimedia

- Enhance communication.
- Add positive visual appeal to presentations.
- Provides entertainment.

New Dimensions of Multimedia Titles

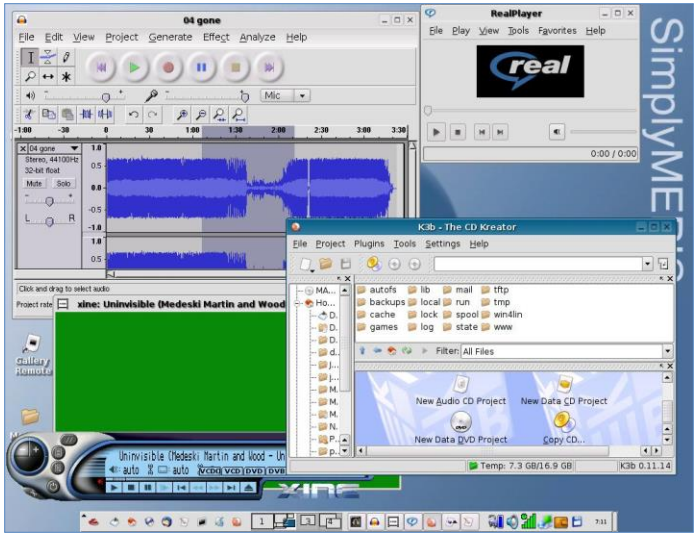
Multimedia has affected our daily lives by adding new dimensions **to published documents, the news, and the entertainment industry**.

Multimedia title is anything that is created by using multimedia.

- **Online books**
- **Music distribution**
- **Interactive games**
- **Online news**
- **Social interaction**
- **Online purchases**

Future of Multimedia

- Multimedia is **only in its infancy**.
- Multimedia will continue to grow as new innovations in computer hardware emerge and new software is developed.



HCI Human Computer Interaction

- **Human-computer interaction : is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them**.
- This means **not only the use of computers** but how we interact with these machines, access key information, use them to communicate with the outside world, perform day-to-day tasks etc.

The H	**Humans good at: Sensing low level stimuli, pattern recognition, inductive reasoning, multiple strategies, adapting "Hard and fuzzy things".**
The C	**Computers good at: Counting and measuring, accurate storage and recall, rapid and consistent responses, data processing/calculation, repetitive actions, performance over time, "Simple and sharply defined things".**
The I	**The list of skills is somewhat complementary. Let humans do what humans do best and computers do what computers do best.**

Why HCI is Important

- The study of our interface with information.
- It is not just ‘how big should I make buttons’ or ‘how to layout menu choices’
- **It can affect**
  - **Effectiveness**
  - **Productivity**
  - **Morale**
  - **Safety**
- **Example: a car HCI design (poor or good)**

Think, Pair and share

- Write down one common device with substantial HCI design choices.
- Discuss with your colleague the pros and cons.
- How does it affect you or other users?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HCI (Human Computer Interaction)

The goals of HCI

Ensuring usability.

"A usable software system is one that supports the effective and efficient completion of tasks in a given work context".

The bottom-line benefits of more usable software system to business users include:

- **Increased productivity**
- **Decreased user training time and cost**
- **Decreased user errors**
- **Increased accuracy of data input and data interpretation**
- **Decreased need for ongoing technical support**

The goals of HCI

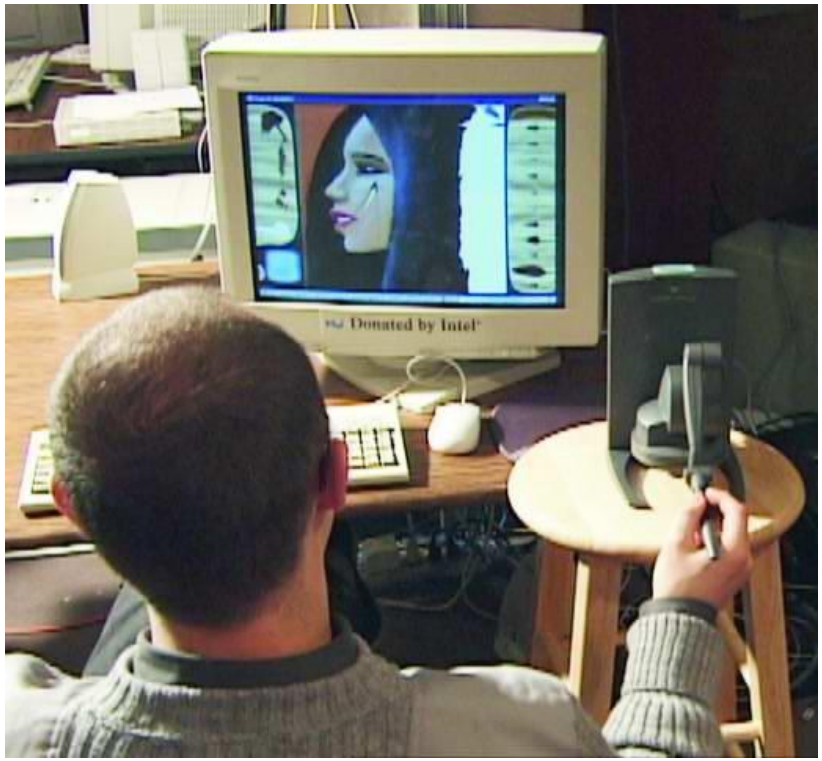
The bottom-line benefits of **usability to the development of organizations include**:

- Greater profits due to more competitive products/services
- Decreased overall development and maintenance costs
- Decreased customer support costs
- More follow-on business due to satisfied customers

- Not to use the term **'user-friendly' which intended to mean a system with high usability but always misinterpreted to mean tidying up the screen displays to make it more pleasing**

HCI Tools

- Sound
- 3D
- Animation
- Video
- Devices
  - Size (small->very large)
  - **Portable (PDA, phone)**
  - Plasticity
- Context sensitive/aware
- Personalizable
- Ubiquitous



What is an Interface?

A point where two objects meet.

A point where the human can tell the computer what to do.

What Tools are Used?

- A keyboard, for **typing**,
- A mouse, for **clicking**,
- A scanner, for **copying**,
- A camera, for **images**,
- A monitor, for **displaying**,
- A printer, for **printing**,
- A sound card. For **audio**,
- A DVD, for **video**,

Human-Computer Interface

- A human and a computer communicates.

  A human usually has 5 senses:

  - **Sight,**
  - **Hearing,**
  - **Touch,**
  - **Taste,**
  - **Smell,**

  – A computer hasn't **any senses** as such, it is machinery, with electrons running around in and out of component devices.

MCQ Questions

1. **The evolution of computer to the current state is defined in terms of the**

   A. Development of computer

   generations of computer

   C. advantages of computer

   D. resources of computer

2. **Advantages of businesses using multimedia**

   A. Enhance communication.

   B. Add positive visual appeal to presentations.

   C. Provides entertainment.

   All previous

3. **is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.**

   A. CHI

   B. ICH

   HCI

   D. HIC