Computer Fundamentals

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Lecture 1

Course Outline

- Introduction to Computer
- Interacting with Computer
- Hardware and Software
- Information Processing
- Number Conversions
- Logical Operations
- Processors
- Storage Devices
- Operating Systems
- Computer Networks
- Data Communication
- Computer Programs
- Flowchart and Pseudocode

Introducing Computer Systems

- ➢ Exploring computers and their uses
  - ❑ The computer defined
  - ❑ Computers for individual users
  - ❑ Computers for organizations
  - ❑ Computers in society
- ➢ Looking inside the computer system
  - ❑ The parts of a computer system
  - ❑ The information processing cycle
  - ❑ (Essential computer) hardware
  - ❑ Software (brings machine to life)
  - ❑ Computer data
  - ❑ Computer users

The Computer Defined

- ➢ Electronic device
    - ❑ Converts data into information

- ➢ Modern computers are digital
    - ❑ Two digits combine to make data
- ➢ Older computers were analog
    - ❑ A range of values to make data

Computers for Individual Use

- ➢ Desktop computers or microcomputers
  - ❑ Once, the most common type of computers
  - ❑ Sit on desk or floor
  - ❑ Performs a variety of tasks
- ➢ Workstations
  - ❑ Specialized computers
  - ❑ Optimized for science or graphics
  - ❑ More powerful than a desktop

Source: *http://www.alphr.com/features/388555/how-to-decommission-or-sell-an-old-pc*

Computers for Individual Use (cont.)

➢ Notebook computers
- ❑ Small portable computers
- ❑ Weighs between 3 and 8 pounds
- ❑ About 8 ½ by 11 inches
- ❑ Typically as powerful as a desktop
- ❑ Can include a docking station

Source: *http://ultrabooknews.com/2012/09/24/make-your-own-modular-docking-station*

Computers for Individual Use (cont.)

➢ Tablet computers
  ❑ Newest development in portable computers
  ❑ Input through pen or touch
  ❑ Run specialized versions of office products and apps

Source: *http://www.sonymobile.com/global-en/products/tablets/xperia-tablet-s*

Computers for Individual Use (cont.)

➢ Personal Digital Assistants (PDAs)
  ❑ Handheld computers
  ❑ Very small computers
  ❑ Note taking or contact management
  ❑ Data can synchronize with desktop

➢ Smart phones
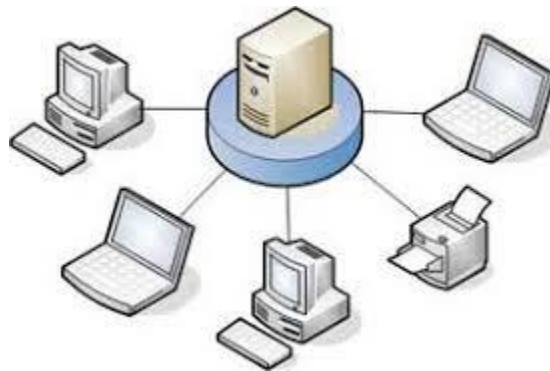 ❑ Hybrid of cell phone and PDA
  ❑ Web surfing, e-mail access

Computers for Organizations

➢ Network servers
  - ❑ Centralized computer
  - ❑ All other computers connect
  - ❑ Provides access to network resources
  - ❑ Multiple servers are called server farms
  - ❑ Often simply a powerful desktop

Source: *http://atronicsys.com/servers.htm*

Computers for Organizations (cont.)

➢ Mainframes
- ❑ Used in large organizations
- ❑ Handle thousands of users
- ❑ Users access through a terminal

Source: *http://blog.syncsort.com/2014/07/offloading-mainframe-hadoop-much-can-save*

➢ Supercomputers
- ❑ The most powerful computers
- ❑ Handle large and complex calculations
- ❑ Process trillions of operations per second
- ❑ Found in research organizations

Computers in Society

- ➢ More impact than any other invention
  - ❑ Changed work and leisure activities
  - ❑ Used by all demographic groups
- ➢ Computers are important because
  - ❑ Provide information to users
  - ❑ Information is critical to society
  - ❑ Managing information is difficult

Computers in Society (cont.)

➢ Computers at home
- ❑ Many homes have multiple computers
- ❑ Many Pakistani homes have Internet
- ❑ Computers are used for
  - o Online shopping
  - o Entertainment
  - o Communication
  - o Learning

Computers in Society (cont.)

➢ Computers in education
  ❑ Computer literacy required at all levels
  ❑ Computer knowledge a prerequisite for several educational degrees

➢ Computers in small business
  ❑ Makes businesses more profitable
  ❑ Allows owners to manage

➢ Computers in industry
  ❑ Computers are used to design products
  ❑ Assembly lines are automated

➢ Computers in government

❑ Necessary to track data for population
- o Police officers
- o Tax calculation and collection

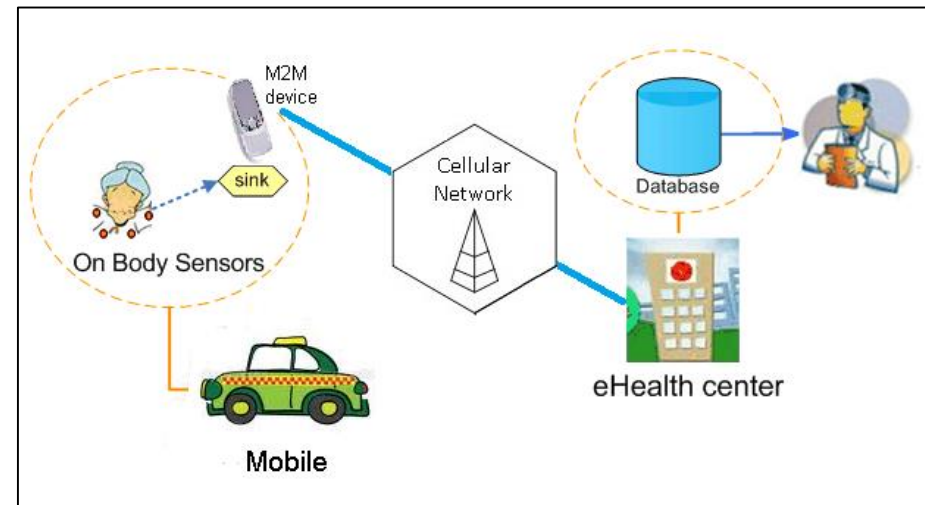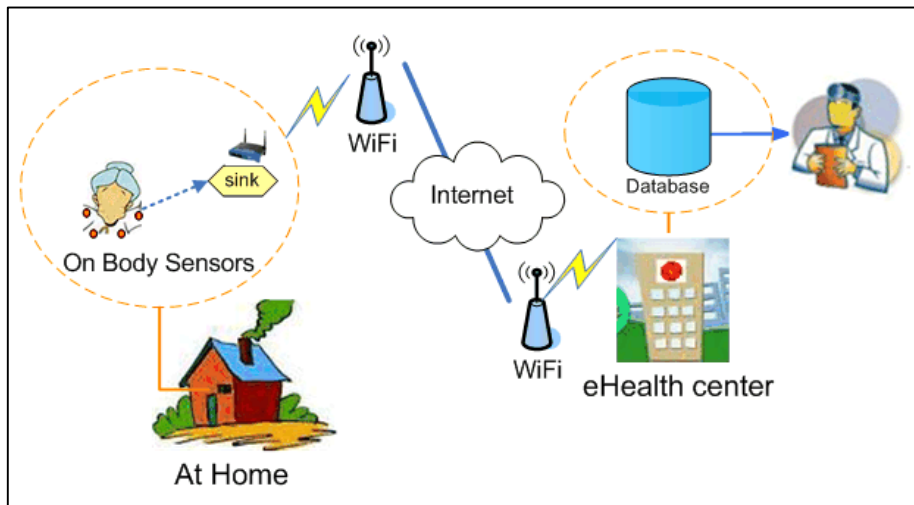❑ Governments were the first computer users

➢ Computers in technology

❑ Advancement in any technological field without computers unthinkable

❑ All technologies dependent on computer

❑ Application areas
- o Energy monitoring
- o Construction
- o Agriculture
- o Automobile
- o Textile
- o Transport

Computers in Society (cont.)

➤ Computers in healthcare
- ❑ Revolutionized healthcare
- ❑ New treatments possible
- ❑ Scheduling of patients improved
- ❑ Delivery of medicine is safer
- ❑ E-healthcare, relationship between healthcare organization and patient
  - ○ Application of internet and related technology
  - ○ Improve access, efficiency, effectiveness, quality of health processes

Source: *http://bbcr.uwaterloo.ca/~x27liang/seehealthbib.htm*