Technology in Action
Lecture Notes
Chapter 2 Hardware

1. Data vs. Information
   a. Data Item ←→ representation of a fact, figure, idea
   b. Information ←→ data items placed in context

2. Bits vs. Bytes CD-R Student Resource
   a. KB kilo ≈1000
   b. MB mega ≈1,000,000 million
   c. GB giga ≈1,000,000,000 billion
   d. TB tera ≈1,000,000,000,000 trillion
   e. … see page 49

3. Computer Categories
   a. Desktop
   b. Laptop
   c. Tablet
   d. Netbook
   e. Pad
   f. Cell (Phone)
   g. Mainframe – data processing – transactions – i/o intensive – heavy trucks
   h. Supercomputers – computation intensive
   i. Embedded computers

4. Input Devices
   a. Mice, Trackballs & other Rodents
   b. Stylus
   c. Scanner
   d. Keyboard
      i. Qwerty
      ii. Dvorak
      iii. Virtual (lazer)
      iv. Flexable

5. Output Devices
   a. Monitors, i.e., display screens
      i. LCD (liquid crystal display) & LED (light emitting diode)
      ii. CRT (cathode ray tube)
      iii. Pixels – red, green, blue, yellow
   b. Printers
      i. Inkjet
      ii. Laser
      iii. Thermal
      iv. Wireless
      v. Cost of printer
      vi. Cost of using the printer
   c. Sound – OPM (other people's music)

6. **System Unit – "box"**
   a. **Motherboard, i.e., Backplane**
      i. **Expansion cards, i.e., adapter cards**
         - **Sound Card**
         - **Video Card**
         - **Modem Card**
         - **NIC (network interface card)**
      ii. **Processor (speed – pico/nano seconds)**
      CPU (central processing unit)
         - **45 billion tasks per second**
         - **Machine Cycles per Second, i.e., Hertz**
            - **Fetch instructions & data from memory**
            - **Execute instruction on data**
            - **Store results back into memory**
         - **3.8 GHz Processor – 3.8 billion machine cycles per second**
         - **Cores – Paths thru the CPU, i.e., effectively multiple processors**
            - **Operating System**
            - **Virus Detection Software**
            - **MS Word**
            - **Spell Check**
      iii. **Memory (speed – nanoseconds)**
         - **RAM (random access memory, i.e., read-write memory) -- volatile**
         - **ROM (read only memory) – nonvolatile**
         - **Cache Memories – freeway ramp between RAM & CPU**
      iv. **Bus Architecture**
         - **FSB (front side bus – CPU ⇆ RAM)**
   b. **Storage Devices (speed – milli/micro seconds) – nonvolatile**
      i. **CD/DVD/BluRay(BD)**
      ii. **Internal Hard Drives**
      iii. **External Hard Drives**
      iv. **Flash Drives/Flash Memory Cards**
      v. **Solid State Drives (SSD)**
   c. **Power Unit**
   d. **Ports – connection point (conversion hardware)**
      i. **USB**
      ii. **Serial – mouse**
      iii. **FireWire – external hard drives, cameras, music/medial players**
      iv. **Ethernet – network (internet, fax, local area network)**
      v. **VGA – video graphics array port (monitors)**
      vi. **DVI – digital video interface port (new LCD monitors, TV, DVD, projectors)**
      vii. **S-video – super video ports**
      viii. **HDMI – high-definition multimedia interface (home theater environments)**
      carries high-definition video & uncompressed digital audio signals