

1.4 Textbook Readings

Input devices- receive user input through mediums such as a microphone. These are used for gathering user input so that it may be interpreted through the computer.

Output devices- output signals sent by the computer, and example of this may be a monitor or a speaker

LCDs (liquid crystal displays) are used in many personal devices such as mobile phones. They are thin and small displays making them a perfect fit for portable devices. The LCD does not produce light, rather it controls the transmission of light. It is typically rod shaped in size.

- Straightens when a current is applied, and it no longer needs to bend light
- Liquid crystal is between two screens polarized at 90 degrees, so light cannot pass unless it is bent
- Modern LCDs use an **active matrix** which has tiny transistor switches within each pixel.
- Then a red, green, or blue mask is associated with each pixel to control the current and so it may produce sharper image

Images are composed of a matrix of pixel elements which can be represented as a matrix of bits, this is known as a bit map.

Touch Screens

Touch screens are a product of the POSTpc era. It uses direct touch instead of the traditional method of using a keyboard and mouse for the user interface. People work as electrical conductors, because of this touch screens take advantage of users touch through glass that is covered with a transparent conductor, distorting the electrostatic field of the screen.

Inside the computer

Integrated circuits- this is also known chip, it is a device combining dozens to millions of transistors.

CPU (central processing unit)- this is also known as a processor.

- Contains datapath, control, and adds numbers
- Tests numbers
- Signals I/O devices to activate

Datapath- the component of the processor that performs arithmetic operations

Control- The component of the processor that commands the datapath, memory, and I/O devices according to instructions

Dynamic random access memory (DRAM) - Memory built as integrated circuits. It provides random access to any location.

Static random access memory (SRAM) - is faster, however it is less dense and hence more expensive. SRAM and DRAM are two layers of memory hierarchy.

Typically, the operating system will encapsulate the details of doing I/O, allocating memory, and other low-level system functions so that application programmers do not need to worry about such details. The combination of the basic instruction set and the operating system interface provided for application programmers is called the application binary interface (ABI).

Computer designers distinguish architecture from an implementation of an architecture along the same lines: an implementation is hardware that obeys the architecture abstraction. These ideas bring us to another Big Picture.

- Communication: Information is exchanged between computers at high speeds.
- Resource sharing: Rather than each computer having its own I/O devices, computers on the network can share I/O devices.
- Nonlocal access: By connecting computers over long distances, users need not be near the computer they are using.