COMPUTER FUNDAMENTALS

Topic : Introduction To computers

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- Overview
- Introduction to Computers
  - Characteristics of Computers
  - History/Evolution
  - Generation Of Computers

Introduction To Computers

- Definition:
  - Its an electronic Device that is used for information Processing.
  - Computer.. Latin word.. compute
  - Calculation Machine
- A computer system includes a computer, peripheral devices, and software

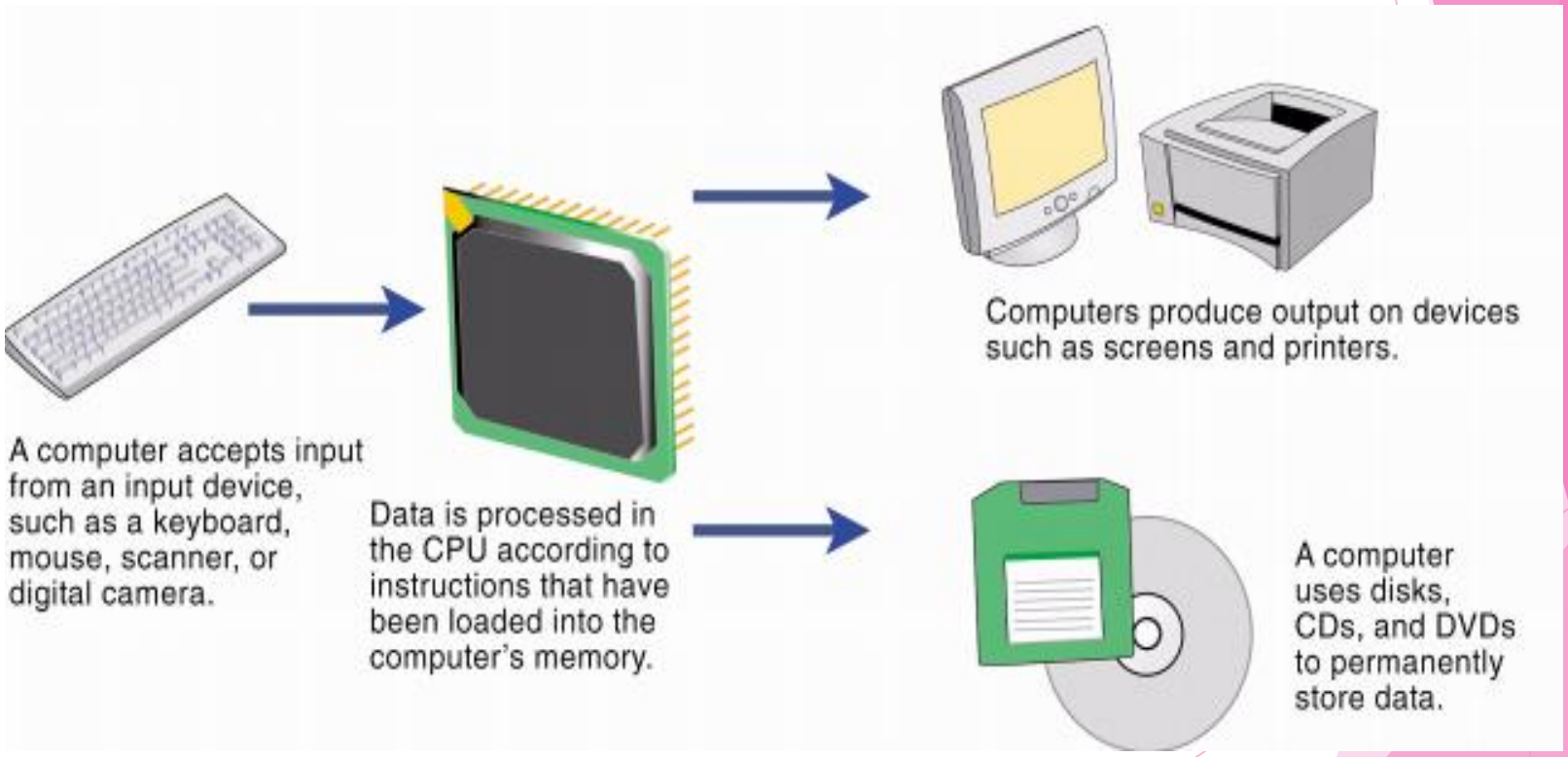
Introduction To Computers

- Accepts input, processes data, stores data, and produces output
- ***Input*** refers to whatever is sent to a Computer system
- ***Data*** refers to the symbols that represent facts, objects, and ideas
- ***Processing*** is the way that a computer manipulates data
- A computer processes data in a device called the ***central processing unit*** (CPU)

Introduction To Computers

- ***Memory*** is an area of a computer that holds data that is waiting to be processed, stored, or output
- ***Storage*** is the area where data can be left on a permanent basis
- Computer ***output*** is the result produced by the computer
- An output device displays, prints or transmits the results of processing

Introduction To Computers



Introduction To Computers

Computer

- Performs computations and makes logical decisions
- Millions / billions times faster than human beings

Computer programs

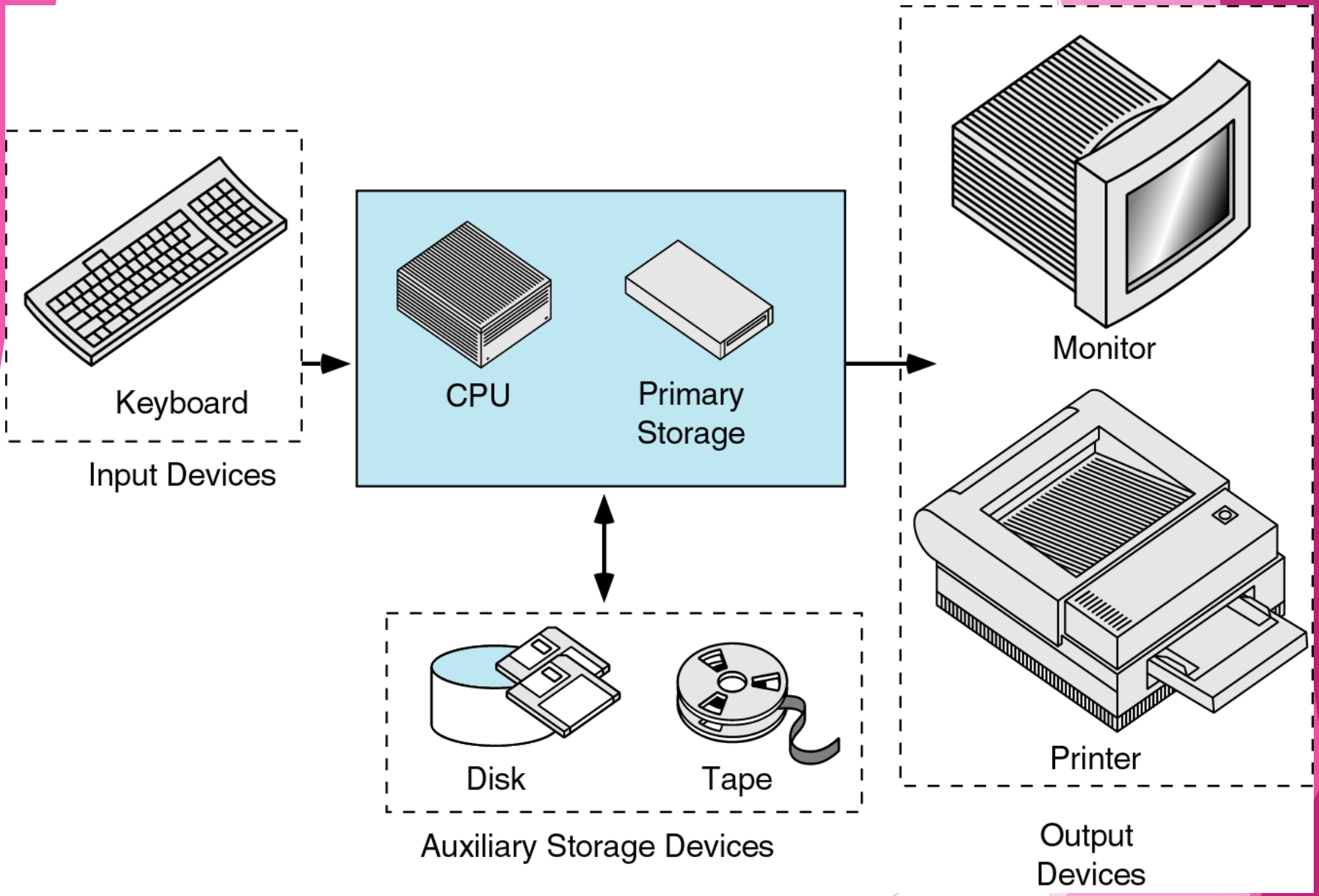
- Sets of instructions for which computer processes data

Hardware

- Physical devices of computer system

Software

- Programs that run on computers


Keyboard
Input Devices
CPU
Primary Storage
Monitor
Printer
Output Devices
Disk
Tape
Auxiliary Storage Devices

Introduction To Computers

- Capabilities of Computers
  - Huge Data Storage
  - Input and Output
  - Processing

Introduction To Computers

- Characteristics of Computers
  - High Processing Speed
  - Accuracy
  - Reliability
  - Versatility
  - Diligence

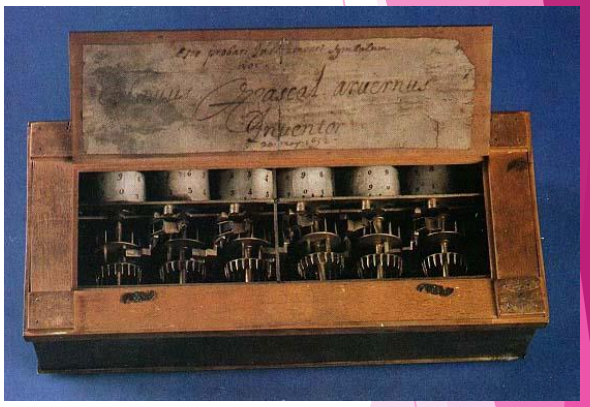
Introduction To Computers

History Of Computers

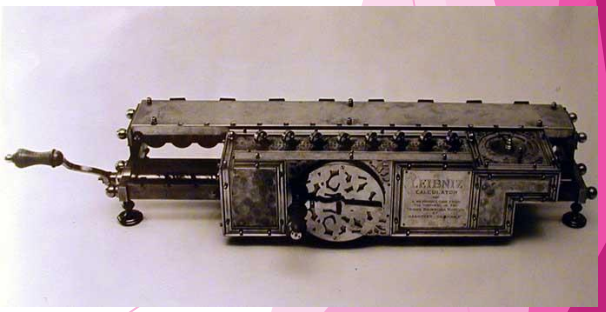
•Before the 1500s, in Europe, calculations were made with an abacus

Invented around 500BC, available in many cultures (China, Mesopotamia, Japan, Greece, Rome, etc.)

•In 1642, Blaise Pascal (French mathematician, physicist, philosopher) invented a mechanical calculator called the Pascaline



•In 1671, Gottfried von Leibniz (German mathematician, philosopher) extended the Pascaline to do multiplications, divisions, square roots: the Stepped Reckoner

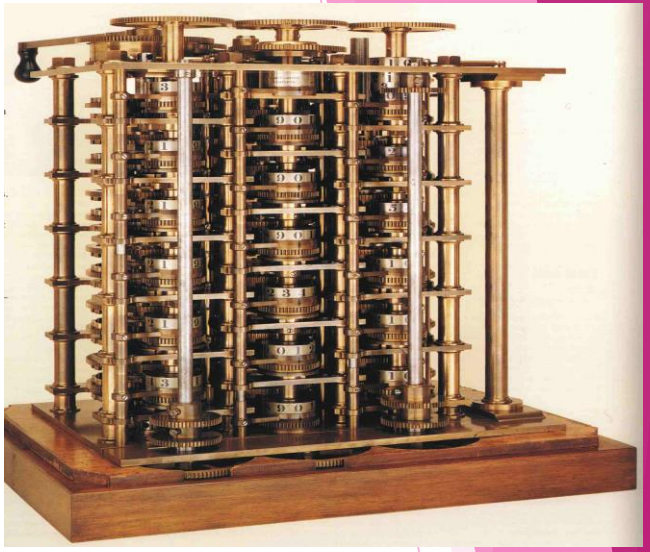


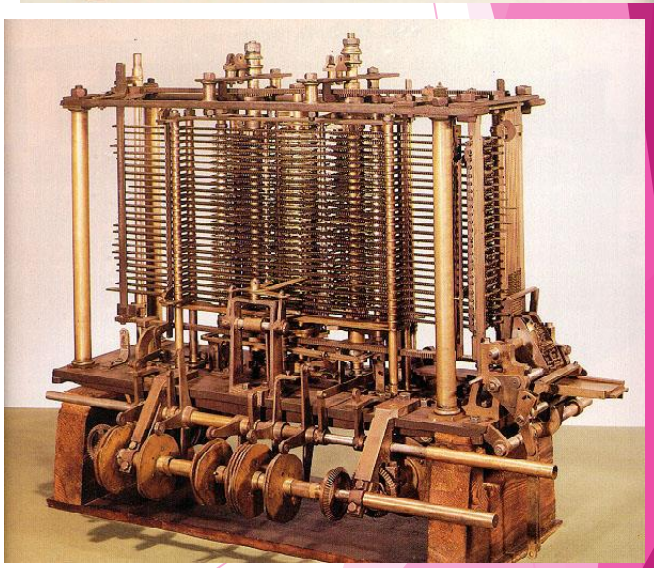
None of these machines had memory, and they required human intervention at each step

- In 1822 Charles Babbage (English mathematician, philosopher), sometimes called the “father of computing” built the Difference Engine

- Machine designed to automate the computation (tabulation) of polynomial functions (which are known to be good approximations of many useful functions)
  - Based on the “method of finite difference”
  - Implements some storage

- In 1833 Babbage designed the Analytical Engine, but he died before he could build it
  - It was built after his death, powered by steam





Introduction To Computers

Generations of Computers

Introduction To Computers

- Generation of Computers
  - First Generation (1946-59)
  - Second Generation(1957-64)
  - Third Generation(1965-70)
  - Fourth Generation(1970-90)
  - Fifth Generation(1990 till date)

Introduction To Computers

Generation 0: Mechanical Calculators

Generation 1: Vacuum Tube Computers

Generation 2: Transistor Computers

Generation 3: Integrated Circuits

Generation 4: Microprocessors

Introduction To Computers

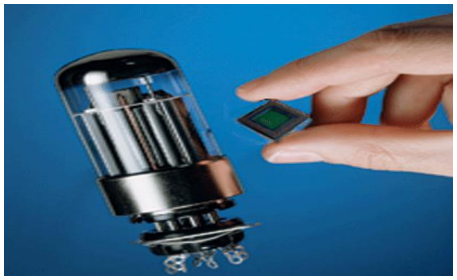
	First Generation	Second Gen.	Third Gen.	Fourth Gen.
Technology	Vacuum Tubes	Transistors	Integrated Circuits (multiple transistors)	Microchips (millions of transistors)
Size	Filled Whole Buildings	Filled half a room	Smaller	Tiny - Palm Pilot is as powerful as old building sized computer

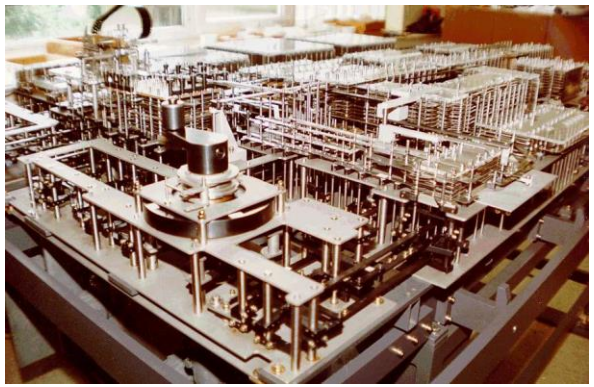
Introduction To Computers

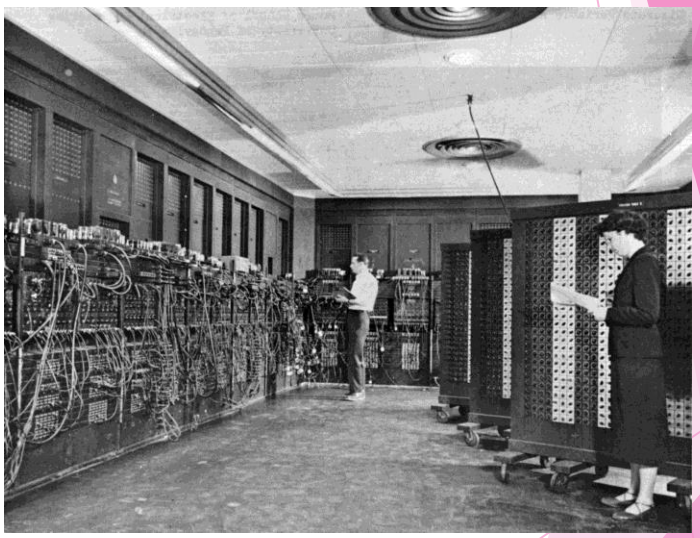
Some Pictures…..

Generation 1 : ENIAC

The ENIAC (Electronic Numerical Integrator and Computer) was unveiled in 1946: the first all-electronic, general-purpose digital computer



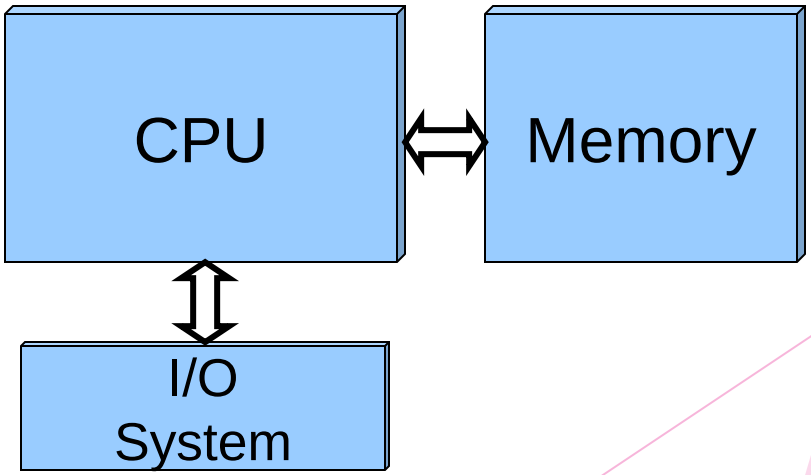




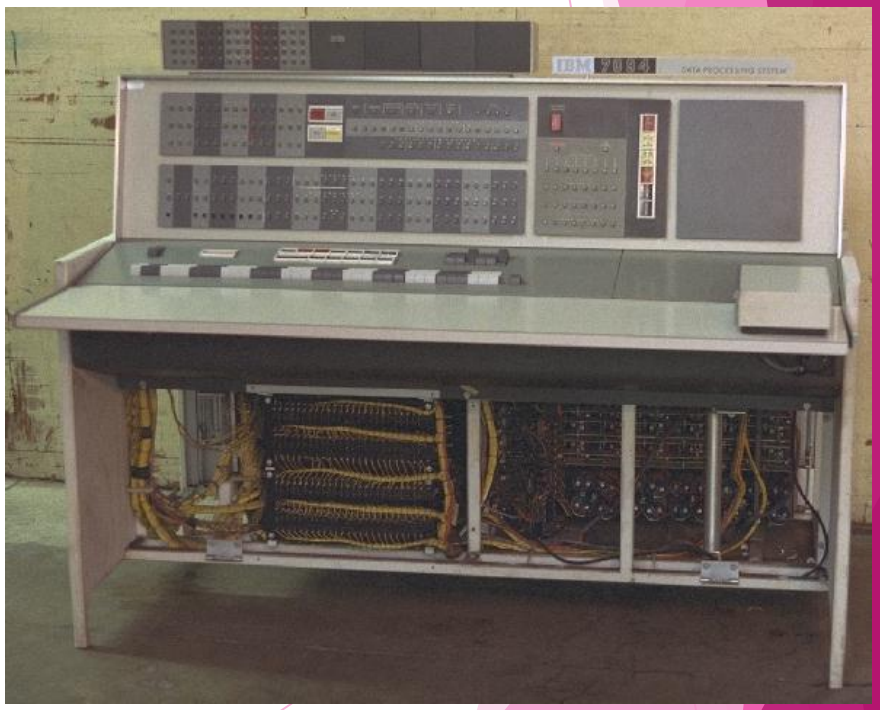
The use of binary

In the 30s Claude Shannon (the father of “information theory”) had proposed that the use of binary arithmetic and boolean logic should be used with electronic circuits

The Von-Neumann architecture



Generation 2: IBM7094



Generation 3: Integrated Circuits

Seymour Cray created the Cray Research Corporation
Cray-1: $8.8 million, 160 million instructions per seconds and 8 Mbytes of memory

Generation 4: VLSI

Microprocessors

Improvements to IC technology made it possible to integrate more and more transistors in a single chip

- SSI (Small Scale Integration): 10-100
- MSI (Medium Scale Integration): 100-1,000
- LSI (Large Scale Integration): 1,000-10,000
- VLSI (Very Large Scale Integration): >10,000

Generation 5?

The term “Generation 5” is used sometimes to refer to all more or less “sci fi” future developments

- Voice recognition
- Artificial intelligence
- Quantum computing
- Bio computing
- Nano technology
- Learning
- Natural languages

Start
8:37
Tuesday, February 17, 2004
T-Mobile
Call Log
Voice Mail
Setup Wireless E-mail
Owner: Jane Wall
(206) 555-1234
Tomorrow: Review Partnership Program
8:00AM-12:00PM
ActiveSync: 5 Unread messages
10 Active tasks
New
iPAQ
T··Mobile·

VAIO

- **Source of Knowledge:**
  The Mother of Information…
  "*The Internet*"
- **The World Wide Web**