



Introduction to Information Technology

CSC109

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1.5 Generations of Computer



1. First Generation using vacuum tubes

- First Generation computers were used during **1942-1955**
- They were based on vacuum tube which has a glass tube that control and amplify electronic signals
- Consume more power with limited performance
- High cost
- Used assembly language- to prepare programs. They were translated into machine level language for execution

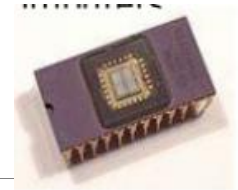
Generation	• Key Hardware Technologies	Key Software Technologies	Key Characteristics	System Example
First (1942-1955)	<ul style="list-style-type: none"> • Vacuum tubes • Electromagnetic relay memory • Punched cards & paper Tape for program feed. • Magnetic tapes & Magnetic drums as secondary memory 	<ul style="list-style-type: none"> • Machine and assembly language • Stored program concept • Mostly scientific applications 	<ul style="list-style-type: none"> • Bulky in size • Highly unreliable • Limited commercial use and costly • Difficult commercial production • Difficult to use 	<ul style="list-style-type: none"> • ENIAC • EDVAC • EDSAC • UNIVAC I • IBM 701



1. Second Generation

- Second Generation computers were used during 1955-1964
- Bell Labs invented Transistors- function like vacuum tubes but smaller, lower power, reliable.
- Low cost
- Magnetic cores as primary memory.(RAM)
- Magnetic disk and tape used as secondary memory
- Index register was introduced which increased flexibility of programming
- High level language like FORTRAN, COBAL etc were used
- Compilers were developed
- Punched cards continued during this period also

Generation	• Key Hardware Technologies	Key Software Technologies	Key Characteristics	System Example
Second (1955-1964)	<ul style="list-style-type: none"> • Transistors. • Magnetic cores as RAM • Magnetic tapes & Magnetic disk as secondary memory 	<ul style="list-style-type: none"> • Batch operating system • High level programming • Scientific and commercial applications • Compiler was introduced 	<ul style="list-style-type: none"> • Faster, smaller more reliable and easier to program than previous generation • Commercial production was still difficult and costly 	<ul style="list-style-type: none"> • Honeywell 400 • IBM7030 • CDC 1604 • UNIVAC LARC



1. Third Generation

- Third Generation computers were used during 1964-1975
- Jack Kilby developed Integrated Circuit (IC)
- An IC combined several Electronic Computers on a small Silicon Chip
- IBM Introduced – Highly Configurable, highly backward compatible Mainframe computer
- Small and medium scale integration technology were implemented CPU, I/O, processors etc
- Smaller, smarter performance
- Comparatively lesser cost
- Faster Processors

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- In beginning Magnetic core memories were used. Later they were replaced by Semiconductor memories (RAM & ROM)
 - Introduced Micro Programming
 - Microprogramming, parallel processing, multi programming, multi user system, were introduced
 - Operating system software were introduced
 - Cache and Virtual memories were introduced.
 - ANSI standardized High level language

Generation	• Key Hardware Technologies	Key Software Technologies	Key Characteristics	System Example
Third (1964-1975)	<ul style="list-style-type: none"> • ICs with SSI and MSI Tech • Larger magnetic cores memory • Larger capacity disks and magnetic tapes secondary storage • Mini computers; 	<ul style="list-style-type: none"> • Time Sharing Operating System • Standardization of high level programming languages • Unbundling of software from hardware 	<ul style="list-style-type: none"> • Faster, smaller, more reliable, easier and cheaper to produce • Commercial, easier to use, upgraded • Scientific, commercial and interactive on-line applications 	<ul style="list-style-type: none"> • IBM 360/370 • PDP-8 • PDP-11 • CDC 6600

Generation	• Key Hardware Technologies	Key Software Technologies	Key Characteristics	System Example
Fourth (1975-1989)	<ul style="list-style-type: none"> • IC's with VLSI • Micro processors semiconductor memory • Larger Capacity hard disk as in built in secondary storage • Magnetic Tapes and Floppy disks as portable storage media • Personal computers • Super computers based on parallel vector processing and symmetric multi-processing technologies • Spread of high speed computer networks 	<ul style="list-style-type: none"> • Operating System for PCs with GUI and Multi windows on a single terminal screen • Multiprocessing OS with Concurrent programming Language • Unix Operating system with C programming Language • PCs, Network based and super computing applications 	<ul style="list-style-type: none"> • Small, Affordable, reliable and easy to use PCs • More powerful and reliable mainframe system and supercomputers • Totally General Purpose Machine • Easier to produce commercially • Easier to upgrade • Rapid Software development Possible 	<ul style="list-style-type: none"> • IBM PC and its Clones • Apple II • TRS-80 • VAX 9000 • CRAY-1 • CRAY-2 • CRAY-X

Generation (Period)	Key hardware technologies	Key software technologies	Key characteristics	Some rep. systems
Fifth (1989- Present)	<ul style="list-style-type: none"> • ICs with ULSI technology • Larger capacity main memory, hard disks with RAID support • Optical disks as portable read-only storage media • Notebooks, powerful desktop PCs and workstations • Powerful servers, supercomputers • Internet • Cluster computing 	<ul style="list-style-type: none"> • Micro-kernel based, multithreading, distributed OS • Parallel programming libraries like MPI & PVM • JAVA • World Wide Web • Multimedia, Internet applications • More complex supercomputing applications 	<ul style="list-style-type: none"> • Portable computers • Powerful, cheaper, reliable, and easier to use desktop machines • Powerful supercomputers • High uptime due to hot-pluggable components • Totally general purpose machines • Easier to produce commercially, easier to upgrade • Rapid software development possible 	<ul style="list-style-type: none"> • IBM notebooks • Pentium PCs • SUN Workstations • IBM SP/2 • SGI Origin 2000 • PARAM 10000

Next Class Plan

1. Generations of computer
2. Classification of Computer
3. The computer system
4. Application of Computer