BCA SEMESTER - II

0302203
HISTORY OF COMPUTING

UNIT – 2
GENERATION OF COMPUTERS

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Index

Introduction

- The computer has evolved from a large-sized simple calculating machine to a smaller but much more powerful machine.
- The evolution of computer to the current state is defined in terms of the generations of computer.
- Each generation of computer is designed based on a new technological development, resulting in better, cheaper and smaller computers that are more powerful, faster and efficient than their predecessors.

Introduction

- Currently, there are six generations of computer.

- In the following subsections, we will discuss the generations of computer in terms of the technology used by them (hardware and software), computing characteristics (speed, i.e., number of instructions executed per second), physical appearance, and their applications.

First Generation Computers (1940 - 1956)

- The first computers used vacuum tubes(a sealed glass tube containing a near-vacuum which allows the free passage of electric current.) for circuitry and magnetic drums for memory.
- They were often enormous and taking up entire room .
- First generation computers relied on machine language.
- They were very expensive to operate and in addition to using a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions(defect or breakdown).
- The UNIVAC and ENIAC computers are examples of first-generation computing devices.
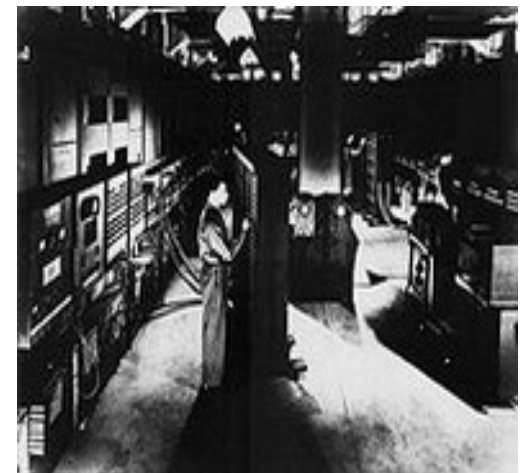
First Generation Computers

- **Advantages :**
- It was only electronic device
- First device to hold memory

- **Disadvantages :**
- Too bulky i.e large in size
- Vacuum tubes burn frequently
- They were producing heat
- Maintenance problems

First Generation Computers

- Examples of the first generation computers include ENIAC, EDVAC, UNIVAC, IBM-701, and IBM-650

- It uses the machine language to take the input knows as 1GL or first generation language.

Second Generation Computers (1956-1963)

- <u>Transistors</u> replaced vacuum tubes and ushered in the second generation of computers.

- Whereas, it is more reliable, faster, cheaper and smaller in size than the *first generation of computers.*

- Second-generation computers moved from cryptic binary machine language to symbolic.

- High-level programming languages were also being developed at this time, such as early versions of COBOL and FORTRAN.

- These were also the first computers that stored their instructions in their memory.

Second Generation Computers

Advantages :

- Size reduced considerably

- The very fast

- Very much reliable

Disadvantages :

- They over heated quickly

- Maintenance problems

Second Generation Computers

- Examples of the second generation computers include IBM 1620, IBM 7094, CDC 1604, CDC 3600, UNIVAC 1108.

- The second generation computers use the magnetic tape and magnetic core as the primary storage, and the secondary storage uses the magnetic disks.

Third Generation Computers (1964-1971)

- The development of the Integrated Circuit was the hallmark of the third generation of computers.
- Transistors were miniaturized and placed on siliconchips, called semiconductors.
- Instead of punched cards and printouts, users interacted with third generation computers through keyboards and monitors and interfaced with an operating system.
- Allowed the device to run many different applications at one time.
- Additionally, it reduces the size of the computer in a small size.

Third Generation Computers

Advantages :

- ICs are very small in size

- Improved performance

- Production cost cheap

Disadvantages :

- ICs are sophisticated

Third Generation Computers

- Examples of the third generation computers include IBM-360 series, Honeywell-6000 series, PDP (Personal Data Processor), and IBM-370/168.

- Moreover, the third generation computers use the COBOL, FORTRAN-II to FORTRAN-IV, PASCAL, ALGOL-68, BASIC by taking the input.

Fourth Generation Computers (1971 - 1980)

- These computers used the VLSI technology or the Very Large Scale Integrated (VLSI) circuits technology.

- Therefore they were also known as the microprocessors.

- Intel was the first company to develop a microprocessor. The first "personal computer" or PC developed by IBM, belonged to this generation.

- VLSI circuits had almost about 5000 transistors on a very small chip and were capable of performing many high-level tasks and computations.

- These computers were thus very compact and thereby required a small amount of electricity to run.

Fourth Generation Computers

Advantages :

- Totally general purpose computer
- Smaller in size and reliable
- No cooling system required.
- Portable and cheap

Disadvantages :

- Very advanced technology required
- Air conditioning was required

Microprocessor

15

Fourth Generation Computers

- **This generation of computers allows users to use the computer for word processing, spreadsheets, file managing and graphics.**

- **The computer languages like C, C++, and DBase are used in this generation to perform the accurate operations.**

- **The concept of networking and CD-ROM came into existence in the fourth generation.**

- **Examples of this generation computer are STAR 1000, CRAY-X-MP (Super Computer), PDP 11, DEC 10, and CRAY-1.**

Fifth Generation Computers (1980 - 20th century)

- In the fifth generation, VLSI technology became ULSI (Ultra Large Scale Integration) technology, resulting in the production of microprocessor chips having ten million electronic components.

- **These computers differ from the previous four generations. Well, these generation computers use the high level of languages like Perl, Python, C, JAVA, etc.**

- **It introduces the laptops, notebooks, PC's, desktops, and many more during this period.**

- **Besides, these computers are based on Artificial Intelligence. Well, the *fifth generation computers perform* the parallel processing which fast results.**

17

Fifth Generation Computers

Advantages :

- Much faster than previous gen.
- Development of AI, Parallel processing
- New version technologies
- Improvement in semiconductor technolo
- Powerful and compact features at cheap

Disadvantages :

- Tend to be sophisticated and complex to
- Their waste can negatively affect the environment.

Fifth generation computers are in designing mode with Artificial Intelligence technology.

18

Fifth Generation Computers

- **This generation is based on parallel processing hardware and AI (Artificial Intelligence) software.**

- **All the high-level languages like C and C++, Java, .Net etc., are used in this generation.**

- **The new operating systems are developed MS Window, Linux and Linux based components are developed.**

- **Example of fifth generation computers are Notebook, Laptop, Desktop, Ultra book, Chrome book, and many more.**

- **Applications are Robotics, Interactive software and applications, video games, voice recognition software**

Sixth Generation Computers (2000 – till date)

- The period of Sixth generation is 2000-till date.

- In the Sixth generation, ULSI technology became UULSI (Ultra2 Large Scale Integration) technology, resulting in the production of microprocessor chips having ten million electronic components.

- This generation is based on parallel processing hardware,Nano technology, AI (Artificial Intelligence) software.

- All the high-level languages like C#, Asp.net, Php, Android, Mobile computing etc., are used in this generation.

Sixth Generation Computers

Sixth Generation Computers

- In the military, the AI helped soldiers for unexpected problems arises in many situations around the world.

- Additionally, it helps to prevent the many of world's spy network problems, and also it can determine the actions occurring high volatile parts of the world.

- In the automobile technology, robots are used for manufacturing, but the artificial intelligence is used in some cars which allow to breaking and wearing the vehicle if necessary.

- Sixth generation computers are optical computer, holographic computer, nano technology, etc.