INFORMATION AND COMMUNICATIONS

UNIVERSTY

SCHOOL OF ENGINEERING

INTRODUCTION TO COMPUTER SYSTEMS ASSIGNMENT ONE

NAME ACKSON MBAO

SIN 2202793089

PROGRAMME BACHELOR OF SCIENCE IN EEE

PHONE 0771815839

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Introduction

Computer are such an integral part of our everyday life.

 Computer is an electronic machine which performs mathematics and

logical calculations.

 Charles Babbage is called the Father of computer.

 Now, in this chapter, we are trying to describe the types of

computers and elaborate classification of computer.

 Computers can be classified in various ways depending on their

generation, working, size and use.

Generations of Computer

* The term ‘Generations’ means improvement in the development of a

product (computer).

* Every new generation, the circuitry has gotten smaller and more

advances than the previous generation

Generation in computer terminology is a change in technology a computer is/was being used.

Initially, the generation term was used to distinguish between varying hardware technologies.

Nowadays, generation includes both hardware and software, which together make up an entire

computer system.

There are five computer generations known till date. Each generation has been discussed in

detail along with their time period and characteristics. In the following table, approximate dates

against each generation has been mentioned, which are normally accepted.

Following are the main five generations of computers

First Generation Computers

The period of first generation was from 1946-1959. The computers of first generation used

vacuum tubes as the basic components for memory and circuitry for CPU (Central Processing

Unit). These tubes, like electric bulbs, produced a lot of heat and the installations used to fuse

frequently. Therefore, they were very expensive and only large organizations were able to

afford it.

In this generation, mainly batch processing operating system was used. Punch cards, paper

tape, and magnetic tape was used as input and output devices. The computers in this generation

used machine code as the programming language.

The main features of the first generation are:

• Vacuum tube technology

• Unreliable

• Supported machine language only

• Very costly

• Generates lot of heat

• Slow input and output devices

• Huge size

• Need of AC

• Non-portable

• Consumes lot of electricity

Some computers of this generation were:

• ENIAC

• EDVAC

• UNIVAC

• IBM-701

• IBM-750

Second Generation Computers

The period of second generation was from 1959-1965. In this generation, transistors were used

that were cheaper, consumed less power, more compact in size, more reliable and faster than

the first-generation machines made of vacuum tubes. In this generation, magnetic cores were

used as the primary memory and magnetic tape and magnetic disks as secondary storage

devices.

In this generation, assembly language and high-level programming languages like FORTRAN,

COBOL were used. The computers used batch processing and multiprogramming operating

system.

The main features of second generation are:

• Use of transistors

• Reliable in comparison to first generation computers

• Smaller size as compared to first generation computers

• Generates less heat as compared to first generation computers

• Consumed less electricity as compared to first generation computers

• Faster than first generation computers

• Still very costly

• AC required

• Supported machine and assembly languages

Some computers of this generation were:

• IBM 1620

• IBM 7094

• CDC 1604

• CDC 3600

• UNIVAC 1108

Third Generation Computers

o Invented in the year 1965.

o In this generation of computer, IC (Integrated Circuits) was used as the

electronic component for computers.

o The development of IC gave birth to a new felid of microelectronics.

o It is small in size, superior performance and reliability than the previous

circuits.

o Robert Noyce of Fairchild Corporation & Jack Kilby of Texas Instruments

discovered the integrated circuits.

The period of third generation was from 1965-1971. The computers of third generation used

Integrated Circuits (ICs) in place of transistors. A single IC has many transistors, resistors, and

capacitors along with the associated circuitry.

The IC was invented by Jack Kilby. This development made computers smaller in size, reliable,

and efficient. In this generation remote processing, time-sharing, multi-programming operating

system were used. High-level languages (FORTRAN-II TO IV, COBOL, PASCAL PL/1,

BASIC, ALGOL-68 etc.) were used during this generation.

The main features of third generation are:

• IC used

• More reliable in comparison to previous two generations

• Smaller size

• Generated less heat

• Faster

• Lesser maintenance

• Costly

• AC required

• Consumed lesser electricity

• Supported high-level language

Some computers of this generation were:

• IBM-360 series

• Honeywell-6000 series

• PDP (Personal Data Processor)

• IBM-370/168

• TDC-316

Fourth Generation Computers

Key Features

 Very large scale integration billions of circuits per cubic foot.

 Portable computer developed.

This is the generation where we are working today. The computers which

we see around us belong to the fourth generation computers.

The period of fourth generation was from 1971-1980. Computers of fourth generation used

Very Large Scale Integrated (VLSI) circuits. VLSI circuits having about 5000 transistors and

other circuit elements with their associated circuits on a single chip made it possible to have

microcomputers of fourth generation.

Fourth generation computers became more powerful, compact, reliable, and affordable. As a

result, it gave rise to Personal Computer (PC) revolution. In this generation, time sharing, real

time networks, distributed operating system were used. All the high-level languages like C,

C++, DBASE etc., were used in this generation.

The main features of fourth generation are:

• VLSI technology used

• Very cheap

• Portable and reliable

• Use of PCs

• Very small size

• Pipeline processing

• No AC required

• Concept of internet was introduced

• Great developments in the fields of networks

• Computers became easily available

Some computers of this generation were:

• DEC 10

• STAR 1000

• PDP 11

• CRAY-1(Super Computer)

• CRAY-X-MP(Super Computer)

Fifth Generation Computers

The period of fifth generation is 1980-till date. 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.

This generation is based on parallel

processing hardware and AI (Artificial

Intelligence) software. AI is an

emerging branch in computer science,

which interprets the means and method

of making computers think like human

beings. All the high-level languages

like C and C++, Java, .Net etc., are used

in this generation.

The main features of fifth generation are:

• ULSI technology

• Development of true artificial intelligence

• Development of Natural language processing

• Advancement in Parallel Processing

• Advancement in Superconductor technology

• More user-friendly interfaces with multimedia features

• Availability of very powerful and compact computers at cheaper rates

Some computer types of this generation are:

• Desktop

• Laptop

• Notebook

• Ultrabook

• Chromebook

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